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FOR

THE YEAR 1900.

PART II.

ON

THE BAROMETRIC DEPRESSIONS

IN

THE YEAR 1900.

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ON THE BAROMETRIC DEPRESSIONS

IN

THE YEAR 1900.

INTRODUCTION.

The present report contains the result of investigations of typhoons, cyclones, and secondary barometric depsessions that passed over the empire and neighbouring seas during the year 1900.

The documents used for the preparation of this report are the manuscripts of tridaily weather charts of this observatory, and storm records sent from the provincial meteorological stations and naval semaphores. The meteorological logs taken on board the imperial naval vessels, mercantile marines, and foreign vessels have also been used, in so far as they are available. The bulletins of the Zikawei meteorological and magnetic observatory, the China coast meteorological registers published by the Hongkong observatory, the meteorological returns sent from the imperial Korean customs at Chemulpo and Wonsan, and Annales de l'observatoire physique centralNicolas have been consulted.

The present report consists of two parts; the first part contains a general review of the barometric depressions in each month, and the second part, detailed descriptions of more important storms. In the general review of the depressions, their origins, motions and lowest barometric readings are concisely stated. The classification of the cyclonic storms into typhoons, continental cyclones, barometric depressions, etc. is, to some degrees, arbitrary, since we could not distinguish them from one another in several cases. Hence, much importance must not be assigned to the classification given in the heading of the description of each cyclone. In the descriptions of more important cyclonic storms, brief statements of their appearances, passages, and the state of the weather during their visitations are fully given. Damages caused by stormy winds and inundations attending the atmospheric perturbations are also stated as far as possible. Tracks of all the barometric depressions described in the text are fully exhibited on the charts at the end of the volume, and those of severe typhoons are given in thick lines. Each of the small circles in the track indicates the position of the centre of depression at the time specified by the figures printed near it.

I. GENERAL REVIEW OF THE BAROMETRIC DEPRESSIONS.

January.—During the present month, 17 barometric depressions passed over this country and neighbouring seas. Six of them were continental depressions, and passed eastwards or toward ENE. None of these depressions were of intense character so as to cause damage to life and property. In fact, several of them passed this country causing no serious change in current weather.

I. *Depression of the 3rd.*—probably came from the sea south of Formosa, and appeared north of the island of Ishigakijima on the afternoon of the 3rd. At first, it moved northeastwards, but it changed its course towards the east under the influence of the anticyclonic area then existing in North China, and went into the Pacific, passing between the island of Okinawajima and of Amami-Oshima on the evening of the same day. A gushing shower occurred at Naha between 3 to 4 p.m. on the 3rd. The amount of rainfall for the one hour was 27.5 mm. The lowest barometer observed there was 758.4 mm at 3pm. L. B.* 755 mm.

II. *Secondary depression of the 4th.*—developed near Kofu in central Japan on the afternoon of the 4th, and passed southeastwards into the Pacific.

L. B. 759 mm.

III. *Depression of the 5th to the 7th.*—probably came from the sea south of Formosa, and appeared in the north of Ishigakijima on the early morning of the 3rd. At first, the depression advanced eastwards under the influence of a high area which was then existing in the yellow sea, North China and Japan sea, and entered the Pacific passing south of the island of Amami-Oshima about 2 p.m. on the 6th. After entering the Pacific the cyclonic centre changed its course towards the northeast, and approached to our southeast coast on the afternoon of the 7th. A rather heary snowfall occurred in central and southeastern Japan on the 7th. Northerly gale prevailed on the southeast coast. The depression went away into the Pacific.

L. B. 755 mm.

IV. *Depression of the 9th to the 10th.*—appeared in the sea south of Riukiu on the afternoon of the 9th, and quickly moved northeastwards. The depression passed off our southeast coast on the night of the 10th, causing threatening weather in southeastern Japan. The area of high barometer was covering over the yellow sea, Eastern sea of China, and North China.

L. B. 750 mm.

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* L. B. stands for the lowest barometer.

V. *Depression of the 9th to the 11th.*—appeared in the straits of Korea on the night of the 9th, moved northeastwards and arrived on the west coast of Hokkaido where it probably filled up on the 11th. A rather severe snow-storm occurred in Southwestern Hokkaido on the afternoon of the 11th.

L. B. 750 mm.

VI. *Depression of the 11th to the 12th.*—appeared in central Japan sea on the 11th, and passed into the Pacific on the morning of the 12th.

L. B. 753 mm.

VII. *Continental depression of the 13th to the 14th.*—came from North China on the 12th, rapidly traversed Northern Korea and appeared in northern Japan sea on the night of the 13th. It crossed over northern Hokkaido on the evening of the 14th, and passed into the sea of Okhotsk. L. B. 760 mm.

VIII. *Depression of the 13th to the 14th.*—appeared in southern Japan sea on the morning of the 13th, moved towards ENE, and entered the Pacific, crossing Northeastern Japan on the 14th. L. B. 750 mm.

IX. *Continental depression of the 16th.*—appeared in the gulf of Tartary on the morning of the 16th, moved southeastwards and entered the Pacific on the night of the same day. L. B. 755 mm.

X. *Depression of the 18th to the 19th.*—probably came from the Eastern sea of China, passed the strait of Tsushima on the 18th, and entered the sea of Japan. The depression approached to the northwest coast of Japan proper on the morning of the 19th, and passed into the Pacific crossing northeastern Japan on the afternoon of the same day. L. B. unknown.

XI. *Continental depression of the 20th to the 21st.*—Developed in the valley of the Yangtsekiang on the 19th, and rapidly moved eastwards. On the night of the 20th, the centre of depression was in the central part of the Eastern sea. It passed south of Kiushiu about noon of the 21st, and passed into the Pacific. It passed off our southeast coast, causing general rainfall in southern Japan and heavy snowfall in central and southeastern Japan on the 21st. L. B. 755 mm.

XII. *Continental depression of the 23rd to the 24th.*—developed near Chongking in the upper Yangtse valley on the 21st, rapidly moved eastwards and entered the Eastern sea of China on the night of the 22nd. The centre of depression passed south of Kiushiu on the morning of the 23rd, and got into the Pacific. It was lying near the island of Hachijo on the morning of the 24th. General rain or snowfall occurred in Japan proper during the visitation of the depression. L. B. 755 mm.

XIII. *Continental depression of the 25th.*—came from Eastern Siberia on the early morning of the 25th, and appeared near the west coast of Hokkaido on the morning. It crossed Hokkaido, and got into the Pacific. L. B. 755 mm.

XIV. *Secondary depression of the 25th.*—developed near Kofu in central Japan on the afternoon of the 25th, and passed into the Pacific, moving southeastwards. A cyclonic system of wind developed around the centre of depression. L. B. 753 mm.

XV. *Depression of the 25th to the 26th.*—appeared in the sea of Okhotsk on the night of the 25th, moved southeastwards, and passed into the Pacific on the morning of the 26th. L. B. unknown.

XVI. *Depression of the 28th to the 29th.*—appeared near the north coast of Formosa on the early morning of the 28th, moved at first northeastwards and arrrived at the sea off Southwestern Kiushiu where it changed its course to the east, under the influence of an area of high barometer which was then occupying North China and the Yellow sea. The depression quickly travelled eastwards along the coast of the Pacific. Threatening weather occurred in Japan proper during the visitation of the depression. L. B. 750 mm.

XVII. *Continctal depression of the 28th to the 29th.*—came from Siberia on the 28th, passed over northern Japan sea on the morning of the 29th, and entered the sea of Okhotsk on the night of the same day. L. B. 750 mm.

February.—The barometric depressions that passed over the empire and the neighbouring seas are eleven in number. All of them were areas of low barometer, and caused no serious atmospheric perturbations

I. *Continental depression of the 2nd to the 3rd.*—appeared in southern China on the 1st, moved eastwards, and traversed over the Eastern sea of China and entered the Pacific. The depression near the island of Hachijo about noon of the 3rd. L. B. unknown.

II. *Continental depression of the 3rd to the 4th* — probably came from Manchuria, passed near Wladiostock on the early morning of the 3rd, and passed into the Pacific, traversing northern Hokkaido on the night of the 3rd. L. B. 750 mm.

III. *Secondary depression of the 4th.*—developed near Kofu in central Japan on the afternoon of the 4th, and entered into the Pacific moving southeastward on the evening. Squally weather occurred in southeastern Japan. L. B. 755 mm.

IV. *Depression of the 4th to the 6th.*—first noticed in the Yellow sea on the morning of the 4th. The depression moved rapidly eastwards, and traversed central Korea and Japan sea. It passed near the strait of Tsugaru on the night of the 5th, and travelled along the south coast of Hokkaido. Snow storm occurred in Hokkaido during the visitation of the depression. L. B. 748. mm.

V. *Continental depression of the 9th.*—appeared near the northwest coast of Hokkaido on the afternoon of the 9th, and passed into the Pacific, traversing southeastwards over central Hokkaido. L. B. 748 mm.

VI. *Depression of the 12th to the 14th.*—appeared in the sea southeast of Formosa on the morning of the 12th, moved along the chain of islands of Riukiu on the 13th, and passed into the Pacific. It was found lying far south of the Hachijo about noon of the 14th. It was a mere low area of no special importance. L. B. 758 mm.

VII. *Depression of the 13th to the 15th.*—appeared in Northern Korea on the afternoon of the 13th, and travelled along the coast of southern Siberia. It crossed over southwestern Hokkaido, and entered the Pacific on the early morning of the 15th. L. B. 755 mm.

VIII. *Depression of the 16th to the 18th.*—came from the sea southeast of Formosa, went northeastwards and entered the Eastern sea of China on the 16th. It passed north of the island of Amami-Oshima on the morning of the 17th, and entend the Pacific. The depression was noticed off our sortheast coast on the 18th. Threatening weather occurred on our Pacific coast during the visitation of the cyclone on the 18th. L. B. 755 mm.

IX. *Continental depression of the 19th to the 21st.*—probably came from Manchuria, and appeared near the coast of Northeastern Korea on the afternoon of the 19th. It traversed over Japan sea and Northeastern Japan, and passed away into the Pacific on the early morning of the 21st. L. B. 755 mm.

X. *Secondary depression of the 22nd.*—developed near Kofu in central Japan on the afternoon of the 22nd, and passed into the Pacific, moving southeastwards. Northerly gale was experienced on the southeast coast of Japan proper. Thunderstorm occurred at Choshi on the night of the 22nd. It may be remarked that the secondary depression that developes in central Japan is in general attended by thunderstorm in summer, but rarely in winter. L. B. 754 mm.

XI. *Continental depression of the 24th to the 26th.*—probably came from Man-

churia, appeared near Vladivostock on the afternoon of the 25th, and passed into Southern Kuriles, traversing Southern Hokkaido on the 26th.

L. B. 755 mm.

March.—During the present month, 17 lows were noted. Of these lows, ten passed along the Pacific coast, and the remaining 7 over the sea of Japan. Of these, six were continental depressions. Most of these depressions were areas of low barometer, and none of these caused no serious storm or high winds.

I. *Continental depression of the 1st to the 2nd.*—probably came from the Yangtse valley and appeared near the northwest coast of Kiushiu on the 1st. It crossed over Western Japan and entered Japan sea on the early morning of the 2nd. Traversing northeastern Japan, the cyclone passed into the Pacific on the same day. L. B. 755 mm.

II. *Depression of the 1st to the 2nd.*—appeared to the east of Amami-Oshima on the 1st, moved northeastwards and passed away into the Pacific on the 2nd. L. B. unknown.

III. *Continental depression of the 2nd to the 3rd.*—came from Siberia, and appeared near the west coast of Hokkaido on the night of the 2nd. It crossed over Southern Hokkaido and entered the Pacific on the early morning of the 3rd. L. B. 755 mm.

IV. *Depression of the 2nd to the 3rd.*—developed near the islands of Formosa on the 2nd, and moved northeastwards. Passing north of the island of Amami-Oshima, the depression entered the Pacific and travelled along the coast of Japan proper on the 4th. L. B. unknown.

V. *Continental depression of the 6th to the 7th.*—came from Siberia and appeared near the west coast of Hokkaido on the early morning of the 7th. It crossed over Southern Hokkaido, and passed into the Pacific on the same day. Snowstorm has occurred in Southern Hokkaido during the visitation of the depression. L. B. 150 mm.

VI. *Secondary depression of the 7th.*—developed near Mount Fujiyama on the afternoon of the 7th, and entered the Pacific, moving southeastwards. A cyclonic wind has developed around the centre, and a passing shower has been experienced several at localities in Southeastern Japan.

L. B. 754 mm.

VII. *Secondary depression of the 8th.*—developed near Mount Fujiyama on the afternoon of the same day, and passed southeastwards. L. B. 753 mm.

VIII. *Depression of the 10th to the 11th.*—probably came from the Yellow sea,

and appeared in the western part of Japan sea on the afternoon of the 10th. The depression passed through the strait of Tsugaru on the early morning of the 11, and passed away into the Pacific, traversing Southern Hokkaido. A severe snowstorm was been experienced in Hokkaido during the visitation of the cyclone. L. B. 735 mm.

IX. *Continental depression of the 13th to the 16th.*—developed in S. Mongolia on the 12th. Marching toward ENE the depression passed south of the Shangtong on the 13th, and appeared in Southern Yellow sea. It traversed over South Korea on the morning of the 14th, and travelled along the coast of Japan sea up to Northeastern Japan. Crossing over the Tsugaru provinces, the cyclone passed away into the Pacific. A rather severe snowstorm was been experienced in Northeastern Japan and Hokkaido on the 15th. L. B. 750 mm.

X. *Secondary depression of the 14th.*—developed in Southern Shikoku on the afternoon of the 14th, moved along the coast at Tokaido, and passed away into the Pacific, touching on Cape Inuboye at 8 p.m. on the same day. Thunderstorm occurred on the west coast of the Kii peninsula on the same day. L. B. 745 mm.

XI. *Depression of the 17th to the 19th.*—developed near the east coast of Formosa on the 16th, moved northeastward and entered the Pacific, passing between the islands of Okinawa and Oshima on the afternoon of the 17th. It appeared in the south of Cape Shiomisaki on the 18th, and passed northeastwards on the 19th. L. B. 753 mm.

XII. *Depression of the 20th to the 22nd.*—appeared in the south of Formosa on the 20th, moved northeastwards and passed into the Pacific on the 21st, travelling along the north side of the Riukiu group. The depression passed by the island of Hachijo on the afternoon of the 22nd, causing a moderate rainstorm on our southeast coast. L. B. 750 mm.

XIII. *Depression of the 23rd to the 25th.*—appeared in the south of Formosa on the 23rd, moved northeastwards, and travelled over the Pacific coast of Japan on the 24th. The depression passed into the Pacific from our east coast on the 25th. General rainfall occurred in Japan proper during the visitation of the depression. L. B. 750 mm.

XIV. *Continental depression of the 24th to the 25th.*—appeared in the south of Irkutsk on the 21st, and moved southeastwards. On the 22nd, the depression was in the northwest of Tientsin. On the 23rd, the centre of depression was deflected by an area of high barometer that was occupying in Eastern

Siberia, and descended towards SSE. The cyclonic centre arrived the straits of Tsushima where it changed its course towards NE on the 24th. Traversing Southern Japan sea the depression approached to the west coast of Hokkaido on the 25th, and finally passed into the Pacific, crossing over Southern Hokkaido. L. B. 754 mm.

XV. *Depression of the 26th to the 27th.*—appeared near the east coast of Formosa on the afternoon of the 26th, and rapidly moved on a southeasterly course. After passing north of the island of Amami-Oshima on the night of the same day, the area of low barometer entered the Pacific, and thence travelled along the coast of Japan. It passed by the island of Hachijo on the afternoon of the 27th. L. B. 755 mm.

XVI. *Depression of the 26th to the 28th.*—first noticed in the southern part of Japan sea on the night of the 27th, moved along the coast of Japan sea up to the west coast of Hokkaido where it finally filled up on the 28th.

L. B. unknown.

XVII. *Depression of the 31th.*—first noted near the southeast coast of Formosa at 6 a.m. of the 31th. The depression moved eastwards, and passed south o the Okinawajima on the afternoon of the same day, causing a thunderstorm in Southerm Riukiu. L. B. 757 mm.

April.—During the present month fifteen depressions passed over the empire and neighbouring seas. A few of them were well developed cyclones, and caused rough weather over the country.

I. *Continental depression of the 1st to the 2nd.*—developed in the upper valley of the Yangtsekiang on the 30th of March, and passed South of Shanghai on the night of the 31th. On the early morning of the 1st of April the depression entered Japan sea through the straits of Korea, and travelled along our northwest coast up to Northern Hokkaido on the 2nd. After crossing over the latter district the cyclone passed away into the Okhotsk on the night. L. B. 746 mm.

II. *Secondary depression of the 1st to the 2nd.*—developed in the Peninsula of Kii on the night of the 1st, and went towards NE, causing squally weather in Southeastern Japan. The depression seems to have entered the Pacific. in the neighbourhood of Mito in Eastern Japan on the 2nd.

L. B. 745 mm

III. *Continental depression of the 5th to the 7th.*—developed in the upper valley of the Yangtsekiang on the 5th, advanced toward NE and entered Japan sea through the Korea straits on the 6th. The depression traversed over

Southern Hokkaido, and passed into the Pacific on the early morning of the 7th. L. B. 754 mm.

IV. *Depression of the 5th to the 7th.*—appeared in the Formosan channal on the afternoon of the 5th, moved northeastwards and passed into the Pacific, after traversing Southern Kiushiu on the 6th. The depression attended thunderstorm near its centre. L. B. 746 mm.

V. *Depression of the 6th to the 7th.*—first noticed near the west coast of Japan on the night of the 6th, traversed central Japan and entered the Pacific on the 7th. L. B. 746 mm.

VI. *Continental depression of the 9th to the 10th.*—developed to the south of Chongking in the upper Yangtse valley on the 7th. Advancing slowly toward ENE the depression passed south of Kiukiang on the evening of the 8th, and near Shanghai about noon of the 9th. The depression arrived to the south of the Islands of Goto on the early morning of the 10th, and thence it travelled along the west coast of Japan, and filled up in the neighbourhood of the Island of Sado on the night of the same day. L. B. 754 mm.

VII. *Depression of the 9th to the 10th.*—probably came from the sea east of Formosa. It was first noticed in the north of the Yaeyama group on the night of the 9th. Moving toward NE the depression crossed over Southern Kiushiu, and passed away into the Pacific on the 10th. L. B. 757 mm.

VIII. *Continental depression of the 9th to the 12th.*—developed in the south of Chongking on the 10th. Moving towards the east the depression traversed the Eastern sea and Japan proper from the 11th to the 12th, and passed away into the Pacific. L. B. 748 mm.

IX. *Depression of the 10th to the 13th.*—came from the Eastern sea on the 10th, and travelled on the Pacific coast of Japan on the 12th, causing stormy weather in Southeastern Japan. L. B. 746 mm.

X. *Depression of the 14th to the 15th.*—appeared to the southeast of Formosa on the 14th, moved at first toward NNE and then to the NE. Passing by the Island of Tanegashima about noon of the 15th, the depression passed into the Pacific. L. B. 760 mm.

XI. *Depression of the 17th to the 19th.*—came from the sea south of the Yaeyama group on the 17th, moved towards NE and passed away into Northern Japan sea on the 19th. L. B. 759 mm.

XII. *Depression of the 18th to the 20th.*—came from the south of the Formosa channel on the morning of the 18th, moved towards NE and traversed over

the Eastern sea on the 18th. The depression travelled on the Pacific coast and went away into the Pacific in the neighbourhood of Mito on the 20th. L. B. 755 mm.

XIII. *Depression of the 21st.*—came from the sea south of Formosa on the morning of the 21st, moved towards NE and passed away into the Pacific on the night of the 21st. L. B. 762 mm.

XIV. *Depression of the 24th to the 25th.*—came from the sea south of Formosa on the night of the 24th, moved northeast and traversed the Eastern sea on the 25th. After passing near the island of Tanegashima the cyclone passed into the Pacific. L. B. 758 mm.

XV. *Secondary depression of the 27th.*—developed near Kofu in Central Japan about noon of the 27th, and entered the Pacific, moving Southeastwards. L. B. 753. mm.

May.—During the present month sixteen barometric depressions passed over the empire and neighbouring seas. Most of them were low areas of moderate intensity and caused no serious storms over this country.

I. *Depression of the 1st to the 3rd.*—appeared near the east coast of Formosa on the afternoon of the first. Moving toward NE the depression traversed over the Eastern sea on the 2nd, and travelled over the Pacific coast of Japan proper on the 3rd. A rather severe storm has occurred in the Eastern Japan. L. B. 748 mm.

II. *Continental depression of the 3rd.*—came from the Yellow sea on the 2nd, moved northeastward and passed into the Pacific, traversing Northern Hokkaido. L. B. 744 mm.

III. *Continental depression of the 4th to the 5th.*—probably came from the Gulf of Tartary, crossed over Hokkaido on the 4th, and passed away into the Pacific on the morning of the 5th. L. B. 744 mm.

IV. *Depression of the 7th to the 8th.*—appeared in the northern part of the Formosan channel on the 6th, moved northeastwards, and traversed over the Eastern sea and Central Korea on the 7th. Thence the depression travelled over Japan sea, and passed away into the Okhotsk on the 8th. Severe storm occurred on the coast of Japan sea and in Southern Korea. L. B. 740 mm.

V. *Continental depression of the 7th to the 8th.*—developed to the Southwest of Tientien on the 5th, moved toward SE and passed by Nagasaki on the afternoon of the 7th. Thence the depression crossed over Northern Kiushiu,

and passed into the Pacific on the night of the 7th. On the morning of the 8th the depression was found passing southeastward over the sea off Cape Shiwomisaki. L. B. 747 mm.

VI. *Continental depression of the 11th to the 12th.*—came from the upper valley of the Yangtsekiang, and appeared in the Yellow sea on the afternoon of the 11th. Moving toward NE the depression crossed over Central Korea and Japan sea, and passed away into the Pacific through the straits of Tsugaru on the night of the same day. L. B. 755 mm.

VII. *Depression of the 12th to the 13th.*—appeared in the straits of Korea on the afternoon of the 12th, moved Southeastward and entered the Pacific, after crossing over Western Shikoku on the 13th. L. B. 755 mm.

VIII. *Secondary depression of the 13th.*—developed near Matsumoto about noon of the 13th, moved northeastward and arrived to the north of Akita on the night. Probably the depression filled up there on the same day. L. B. 750 mm.

IX. *Depression of the 14th to the 15th.*—appeard in the Southern Japan sea on morning of the 14th, moved northeastwards and passed into Okhotsk on the night of the 15th. L. B. 750 mm.

X. *Secondary depression of the 15th.*—developed near Mito on the east coast on the morning of the 15th, and passed northeastward into the Pacific. L. B. 753 mm.

XI. *Continental depression of the 17th to the 18th.*—appeared to the west of Vladivostock on the 17th, moved toward NE, and entered the Okhotsk crossing Southern Saghalien on the 18th. Southerly strong gale occurred. L. B. 748 mm.

XII. *Depression of the 18th to the 21st.*—first noticed near the east coast of Formosa on the afternoon of the 18th. Moving northeastward the depression travelled over the Eastern sea, the Pacific coast of Japan proper and entered the Pacific on the 21st. Stormy weather occurred in Japan proper on the 20th and 21st. L. B. 748 mm.

XIII. *Secondary depression of the 20th to the 21st.*—developed near Shimonoseki on the afternoon of the 20th, moved northeastwards and passed away into the Okhotsk on the 21st, causing southerly gale in Hokkaido. L. B. 747 mm.

XIV. *Depression of the 23rd to the 24th.*—appeared near Foochow on the early morning of the 23rd, moved towards NE and arrived to Southern Kiushiu

on the night of the 23rd. Moving towards SE the depression passed into the Pacific on the 24th. L. B. 255 mm.

XV. *Continental depression of the 27th to the 28th.*—developed in the upper valley of the Yangtsekiang, and was found to be lying between Chonking and Ichang on the 27th. Advancing along the river the cyclone passed by Shanghai on the evening of the 26th, and arrived to Western Kiushiu on the morning of the 28th. The depression passed into the Pacific crossing over Southern Kiushiu on the same day.

L. B. 750 mm.

XVI. *Secondary depression of the 29th to the 30th.*—developed in the plateau of Central Japan on the Pacific, causing northerly gale on our Southeast coast on the 30th. L. B. 748 mm.

June.— During the present month 10 depressions were traced All of them were low areas of no special importance.

I. *Depression of the 5th to the 6th.*—The depression was first noticed to the ENE of Luzon on the 4th. On the early morning of the 5th the depression appeared to the east of the Yaeyama group, and continued its northeasterly march. After travelling over the Pacific south of Southern Japan the depression passed northeastward. L. B. 753 mm.

II. *Continental depression of the 10th to the 11th.*—probably came from North China on the 9th and made its way toward the east. It was found passing near Wladivostock on the afternoon of the 10th. After crossing over Northern Japan sea the cyclone passed through the straits of Soya on the afternoon of the 11th, and went away into the Okhotsk. L. B. 750 mm.

III. *Depression of the 10th to the 11th.*—appeared near Quelpart island on the 10th, moved eastward and travelled over Shikoku and. Southern Kii peninsula on the 11th. It passed into the Pacific on the night of the same day. L. B. 753 mm.

IV. *Depression of the 13th to the 14th.* - developed in the northern part of Formosan Channel on the night of the 13th. Moving toward NE the depression arrived near the west coast of Kiushiu on the 14th, and disappeared there. L. B 752 mm.

V. *Continental depression 22nd to the 23rd.* — appeared in the middle Yangtse valley on the 22nd, moved toward NE and entered the Yellow sea Crossing over central Korea the depression passed into the sea of Japan on the 23rd. Owing to the sparseness of data the track of the depression could not be traced with certitude. L. B. unknown.

VI. *Secondary depression of the 23rd to the 24th.*—developed near the west coast of Japan proper on the afternoon of the 23rd, and arrived to the neighbourhood of Niigata on the morning of the 24th. The depression filled up there. L. B. 753 mm.

VII. *Continental depression of the 24th to the 25th.*—came from the Peninsula of Shangtong on the 24th. Moving toward SE the depression arrived to the neighbourhood of Quelpart island where it recurved toward the east. The cyclone travelled over the Inland sea district and the plateau of central Japan on the 25th, and passed away into the Pacific from our east coast. L. B. 749 mm.

VIII. *Continental depression of the 25th to the 26th.*—came from Manchuria on the 25th, and appeared to the west of Vladivostock on the evening of the day. Making its way toward E the deprassion crossed over Northern Japan sea and Southern Hokkaido and pasted away into the Pacific on the night of the 26th. Threatening weather was experienced in Hokkaido during the visitation of the cyclone. L. B. 748 mm.

IX. *Depression of the 28th to the 29th.*—came from the Eastern sea of China on the 28th, and travelled along the Pacific coast of Southern Japan on the 29th. L. B. 754 mm.

X. *Depression of the 29th to the 30th.*—developed in Northern Formosa on the afternoon of the 29th, and entered the Pacific on the 30th moving toward ENE. L. B. 753 mm.

July.—During the present month 12 barometric depressions passed over the empire and neighbouring seas. With a single exception of the typhoon which visited this country from the 5th to the 8th, they were of moderate nature, and caused no serious storms.

I. *Depression of the 4th to the 5th.*—appeared near the Goto group on the afternoon of the 4th, and arrived to the neighbourhood of Matsuyama crossing over Northern Kiushiu. The depression filled up there on the morning of the 5th. L. B. 753 mm.

II. *Depression of the 5th.*—appeared off our South coast on the early morning of the 5th, moved toward the northeast, and disappeared from our area on the evening of the same day. L. B. 755 mm.

III. *Continental depression of the 5th.*—came from the Amur district on the morning of the 5th, and passed into the Okhotsk, traversing Southern Saghalien on the night of the same date. L. B. unknown.

IV. *Typhoon of the 5th to the 8th.*—This typhoon was first noticed to the northeast of Luzon on the 5th. It approached the east coast of Formosa on the night of the same day. On the 6th the typhoon crossed over Northern Formosa and the channel and arrived in the neighbourhood of Foochow where it recurved toward the northeast. At Taihoku the barometer fell to 741.5 mm. at 8,30 a.m. on the same day, and several flashes of lightning were observed.

After traversing the Eastern sea the typhoon approached Western Kiushiu on the night of the 7th, and travelled over the Island Shikoku, and the southern part of the peninsula of Kii on the 8th. Thence, it passed eastward along our southeast coast, and disappeared from the limit of our area on the afternoon of the same day. Severe storm occurred in this country, and caused a great deal of damages in the prefectures over which the centre passed. The rainfall attended to the typhoon was enormous; On the 7th heavy rain fell on the west coast of Kiushiu; and the total amount for the day exceeded 100 mm. at several localities on the coast. On the 8th, precipitation more than 200 mm. was observed at Hamamatsu on the southeast coast of Japan proper. As the consequence of the excessive rainfall several rivers rose rapidly, and flowed over their banks, causing enormous loss of plantations and property. L. B. 741 mm.

V. *Secondary depression of the 8th.*—developed in the Bay of Wakasa on the early morning of the 8th. Moving northeastward the depression crossed over Northern Hokkaido, and passed away into Southern Kuriles on the night of the same day. L. B. 750 mm.

VI. *Depression of the 9th to the 11th.*—Probably came from the eastern sea of Formosa on the 9th. Moving toward NE the depression passed through the straits of Tsushima on the night of the 10th, and travelled over Japan sea toward Southern Saghalien on the 11th. L B. 748 mm.

VII. *Continental depression of the 11th to the 13th.*—Appeared in the Southern part of Japan sea on the night of the 11th. Moving southeastward the depression crossed over Western Japan on the 12th, and passed into the Pacific, causing rainfall over Japan proper. L. B. 745 mm.

VIII. *Continental depression of the 14th to the 15th*—developed to the north of Ichang in the upper valley of the Yangtsekiang on the 13th. Making its way toward ENE the cyclone passed the neighbourhood of Tsingtao on the afternaon of the 14th, and continued its eastward movement. After traversing over Japan sea the depression got into the Pacific, crossing Southern Hokkaido on the 15th. L. B. 752 mm.

IX. *Depression of the 17th to the 19th.*—first noticed in the strait of Korea on the afternoon of the 16th. Moving toward NE the depression crossed over Eastern Japan, and passed away into the Pacific on the night of the 19th.

L. B. 747 mm.

X. *Depression of the 19th to the 20th.*—appeared in the Yellow sea on the early morning of the 19th, traversed over Southern Korea Japan sea and northeastern Japan, and passed into the Pacific on the 20th.

L. B. 751 mm

XI. *Continental depression of the 22nd to the 23rd.*—came from Amur district on the night of the 22nd, and passed into the Okhotsk on the 23rd.

L. B. unknown.

XII. *Continental depression of the 26th to the 27th.*—came from amur district on the 26th, moved SE ward passed into the Pacific, crossing over southern Hokkaido on the night of the 26th. L. B. 752 mm.

August.—During the present month seven barometric depressions were traced. Two of them were typhoons of unusual violence. The typhoon of the 17th to the 19th is one of the memorable storms that visited this country in recent times.

I. *Continental depressions of the 4th to the 5th.*—Came from Eastern Siberia on the 4th, and entered the sea of Okhotsk, passing through the strait of Soya on the morning of the 5th. Thence, the depression crossed Southern Kuriles, and passed away into the Pacific on the night of the same day.

L. B. 755 mm.

II. *Continental depression of the 6th to the 8th.*—Appeared in the sea off Western Hokkaido on the afternoon of the 6th, and passed into the Okhotsk, traversing the strait of Soya on the morning of the 7th.

L. B. 753 mm.

III. *Depression of the 7th to the 8th.*—First noted in the strait of Korea on the early morning of the 7th. It moved northeastwards and travelled along the west coast of Japan proper. On the 8th it passed into the Pacific, traversing northeastern Japan. L. B. 755 mm.

IV. *Continental depression of the 12th.*—came from Eastern Siberia and passed into the Okhotsk, traversing Southern Saghalien on the 12th.

L. B. unknown.

V. *Typhoon of the 17th to the 19th.*—Appeared in the sea southeast of the Okinawa islands on the 17th, moved rapidly northwards and approached

the South coast of Kiushiu on the early morning of the 19th. After traversing Kiushiu and the western part of the Inland sea district, the typhoon passed into the sea of Japan on the afternoon of the 19th. Thence, the cyclone travelled over Japan sea, and passed away into the interior of Eastern Siberia. A heavy storm occured in Western Japan on the 19th, and resulted in a great damage. A fuller description of this storm will be given in the next chapter. L. B. 717 mm.

VI. *Typhoon of the 22nd to the 25th.*—First noted in the sea southeast of the Riukiu on the night of the 22nd. The typhoon moved at first towards the northwest, and entered the Eastern sea of China, passing south of the Oshima on the morning of the 23rd. Arriving on the 29th parallel of latitude the cyclonic centre recurved its course towards NE, and travelled along the west coast of Kiushiu on the 24th. After traversing the strait of Tsushima, it passed over Japan sea and disappeared in the interior of Siberia on the 25th. L. B. 738 mm.

VII. *Typhoon of the 25th to the 27th.*—Appeared in the sea northeast of Luzon on the 25th, and moved northwestward. After crossing northern Formosa on the night of the 26th, the typhoon entered the Formosan channel, and passed into the continent. Heavy rain fell in Northern Formosa during the visitation of the cyclone. L. B. 748 mm.

September.—During the present month nine barometric depressions were traced. Two of them were typhoons of unusual violence. The typhoon of the 26th to the 29th was most remarkable rotatory storm; it crossed over Southeastern Japan, and caused severe tempest over this country. The centre of the typhoon was very deep, and the barometer fell to 718 mm at the town of Hamamatsu near which the centre passed.

I. *Continental depression of the 1st to the 3rd*—first noticed in the Liaotung peninsula on the morning of the 1st, moved eastwards, and crossed over North Korea on the same day. After entering Japan sea the depression made its way toward NE, and passed away into the Okhotsk on the 2nd. L. B. 757. mm.

II. *Continental depression of the 2nd to the 4th.*—first noticed in central Korea on the afternoon of the 2nd. It moved northeastwards, and passed into the Okhotsk on the 4th, after it traversing Japan sea and Southern Saghalien. L. B. 755 mm.

III. *Depression of the 5th to the 10th.*—developed in the Eastern sea of China on the 5th. Moving towards the northeast the depression passed through

the strait of Korea on the 6th, and entered Japan sea. After traversing the sea the depression crossed over Northern Hokkaido on the 10th, and passed away into the Okhotsk, causing a rather severe storm.

L. B. 750 mm.

IV. *Typhoon of the 10th to the 20th.*—This typhoon was first noticed in the South of the Bonins on the afternoon of the 10th, and was found to be rapidly moving to due west. It appeared near the island of Okinawa on the morning of the 13th. Moving toward WSW the typhoon-centre crossed over Northern Formosa and the channel on the 15th, and entered the continent in the neighbourhood of Foochow. It changed its course toward N, and then toward NE, and entered again the Eastern sea, passing the south of Shanghai on the morning of the 17th. After entering the continent the typhoon lost its inherent energy, and degenerated into a mere depression. The typhoon traversed over South Korea on the 18th, and Japan sea on the 19th, and passed away into the Pacific through the strait of Tsugaru. The detailed description will be given in the last chapter. L. B. 725 mm.

V. *Depression of the 18th to the 19th.*—appeared in the south of Cape Shiwomisaki on the early morning of the 18th, and passed away into the Pacific, moving toward NE. L. B. 751 mm.

VI. *Depression of the 20th to the 22nd.*—appeared in the south of the Yaeyama group on the early morning of the 29th, moved northeastward, and entered Japan sea, passing through the strait of Korea on the afternoon of the 21st. The depression travelled over Japan sea, and passed away into the Pacific, crossing over Southern Hokkaido on the 22nd. L. B. 754 mm.

VII. *Depression of the 23rd to the 25th.*—appeared in the southeast of the island of Okinawa on the early morning of the 23rd, moved northeastward, and arrived to the south of Cape Shiwomisaki about noon of the 24th. Thence it travelled along our southeast coast, and disappeared from our area. A rainstorm occurred on the southeast coast of Japan during the visitation of this depression. L. B. 754 mm.

VIII. *Continental depression of the 26th to the 27th.*—came from North Korea, and appeared to the south of Wladiostok on the afternoon of the 26th. The depression traversed over Northern Japan sea and Northern Hokkaido, entered the Okhotsk on the early morning of the 27th. L. B. 752 mm.

IX. *Typhoon of the 26th to the 29th.*—appeared to the east of Luzon on the 24th. Moving toward NW the typhoon arrived to the southeast of the

Riukiu group on the 26th, and was central over Naha on the night of the same date. There the typhoon changed its course toward NE, and appeared near our south coast on the morning of the 29th. It entered the coast of Tokaido in the neighbourhood of Hamamatsu on the afternoon of the 29th, and passed into the Pacific, traversing Southeastern Japan. Heavy storm raged over this country during the visitation of the typhoon. A detailed description will be given in the next chapter. L. B. 718 mm.

October.—During the present month twelve depressions were traced. Five of them were centinental depressions, and one of them was a typhoon of moderate intensity. This typhoon passed south of Formosa, and could not be traced distinctly owing sparseness of the data.

I. *Depression of the 1st to the 3rd.*—appeared in the sea south of the Yaeyama group on the early morning of the first, and entered the Eastern sea moving northeastwards. Passing through the strait of Osumi (Van Diemen strait) on the early morning of the 2nd the depression entered the Pacific, and travelled along our south coast. It traversed the southeastern part of Japan proper on the early morning of the 3rd, and passed towards the Kuriles. A general rainfall occurred in Japan proper during the passage of the depression. L. B. 757 mm.

II. *Secondary depression of the first to the 2nd.*—developed in the strait of Tsushima on the afternoon of the 1st, and moved northeastwards. It traversed Japan sea, and passed into the Okhotsk on the night of the 2nd. L. B. 755 mm.

III. *Secondary depression of the 3rd.*—developed in the neighborhood of Mount Fuji on the afternoon of the 3rd, and passed into the Pacific, moving toward SSE. L. B. 754 mm.

IV. *Depression of the 5th to the 7th.*—First noted in the sea off the south coast on the night of the 5th, and travelled eastward along the southeast coast of Japan, passing by the island of Hachijo on the early morning of the 7th. L. B. 757 mm.

V. *Continental depression of the 5th to the 7th.*—came from North China on the 5th, and appeared in Northern Japan sea on the morning of the 6th. It passed into the Okhotsk, touching on Cape Soya on the night of the 6th. L. B. 756 mm.

VI. *Continental depression of the 8th to the 10th.*—probably came from the Yangtse valley on the afternoon of the 8th. It appeared near the southwest coast of Korea on the night of the same day, and crossed over the

peninsula to Japan sea. Moving on the northeasterly course the cyclone visited the neighbourhood of Cape Soya on the morning of the 10th, and passed away into the Okhotsk. A rather severe rainstorm occurred in Hokkaido during the visitation of the storm. L. B. 745 mm.

VII. *Continental depression of the 12th to the 14th.*—apperred in the west of Wladiostok on the 12th, and made its way toward the east. After crossing northern Japan sea and Hokkaido the continental depression passed into the Pacific on the 14th. L. B. 757 mm.

VIII. *Depression of the 13th to the 14th.*—appeared in the south of the Okinawa group on the 13th, and arrived to the south of the Island of Hachijo on the afternoon of the 14th. The depression caused general rainfall over our southeast coast on the 14th. L. B. unknown.

IX. *Continental depression of the 20th to the 21st.*—came from Siberia on the 20th, and passed into the Okhotsk, crossing over Southern Sagkalien on the night of the same day. L. B. 755 mm.

X. *Typhoon of the 19th to the 21st.*—first noticed to the northeast of Luzon on the 19th. Moving toward the west the typhoon was found to be lying to the south of South cape of Formosa on the 20th. It moved further westwards and arrived in the sea south of the Pescadores on the 21st. Japanese cruiser "Azuma" encountered the centre of this typhoon to the southsouthwest of South cape on the 20th. L. B. 745 mm.

XI. *Continental depression of the 30th to the 31st.*—On the 29th a depression was gradually developing in the south of Chonking in the upper valley of the Yangtsekiang. Moving along the river the depression passed south of Kiukiang and Nanking and passed into the Eastern sea in the neighbourhood of Shanghai. The depression appeared to the west of Quelpart island on the early morning of the 30th, and thence it traversed the strait of Korea and Japan sea. After passing Northern Hokkaido the depression entered the Pacific on the 31st. Gale and general rainfall occurred in Hokkaido during the visitation of the depression. L. B. 754 mm.

XII. *Depression of the 30th to the 31st.*—probably came from the sea south of Formosa on the 30th. After moving northeastward the depression passed through the strait of Tsushima on the afternoon of the 30th, and travelled along the coast of Japan sea. It crossed over the extreme north of Japan proper about noon of the 31st, and passed away into the Pacific, causing general rainfall in Northern Japan. L. B. 754 mm.

November.—During the present month twelve depressions passed over Japan and

neighbouring seas. Among them the typhoon of the 15th to the 17th is most noteworthy.

I. *Continental depression of the 4th to the 6th.*—On the 1st, the depression appeared in the north of Tomsk, and moved towards SE. On the afternoon of the same day the depression crossed over Lake Baikal, and continued its southeastward motion. On the 3rd it passed the north of Peking, and traversed North Korea on the evening of the same day. On the 5th the depression passed by Wladiostok, and approached the west coast of Hokkaido. After traversing Hokkaido it passed into the Pacific on the 6th. Gale occurred in Eastern Hokkaido. L. B. 754 mm.

II. *Depression of the 8th.*—appeared in Northern Japan sea on the 8th, and passed into the Pacific, traversing Southern Hokkaido, causing northwesterly gale and general rainfall there. L. B. 755 mm.

III. *Continental depression of the 11th.*—First noted in the southeast of Lake Baikal on the 8th. Marching southeastward, the depression traversed north China and approached Wladiostok on the 9th. On the early morning of the 11th, the depression appeared near the west coast of Hokkaido, and travelled over Northern Hokkaido towards the Pacific. The depression was at first a low area of moderate intensity, but it rapidly developed on its way towards the east, and turned to a fully developed cyclonic storm. A rather severe rain or snowstorm occurred in Hokkaido during the passage of the depression. L. B. 740 mm.

IV. *Depression of the 10th to the 11th.*—appeared in central Formosa on the afternoon of the 10th. Moving northeastwards the depression traversed over the Eastern sea of China, and appeared at the sea off our South coast on the 11th. The centre of depression landed on the Peninsula of Kii, traversed Eastern Japan, and passed into the Pacific on the night of the 11th. A severe rainstorm occurred in Eastern Japan during the visitation of the storm. Heavy rain fell at several stations on the Pacific coast. Fortunately however, as the storm-centre passed very rapidly the loss in property was comparatively little in the prefectures concerned. L. B. 745 mm.

V. *Continental depression of the 15th to the 16th.*—came from the gulf of Tartary on the 15th, crossed over Hokkaido and passed into the Pacific on the early morning of the 16th. L. B. 754 mm.

VI. *Typhoon of the 15th to the 17th.*—This typhoon was first noted in the neighbourhood the island of Guam on the 13th. Moving towards WNW the centre of typhoon appeared in the sea east of Luzon on the 15th where it changed

its course towards NNE. On the early morning of the 16th it was found lying in the south of Naha. Rapidly advancing on a northeasterly course the typhoon passed south of Cape Shiwomisaki about noon of the 17th, and off our southeast coast on the night of the same day. The velocity of the progressive motion of the typhoon was at first very small, but it rapidly increased as it moved northeastwards. The central depth of the typhoon was not known with certainty, but it is highly probable that the barometeric reading in the centre was below 730 mm. since 736.2 mm. was observed at Nagatsuro station at 5 p. m. on the 17th when the station was within about 100 km from the typhoon-centre.

Severe rainstorm occurred in Southeastern Japan, and caused a great deal of damage there. The force of gale was most violent on the southeast coast. The maximum velocity of 58 m.p.s. was observed at the Nera station at the 9 a. m. of the 17th. The wind reached 51 m. p. s. at 5 p. m. at Nagatsuro on the same day when the anemometer of the station was blown away by a gust. L. B. 730 mm.

VII. *Continental depression of the 20th to the 21st.*—On the 17th a depression was noted near Lake Baikal. Moving towards SE the depression arrived to the north of the gulf of Pechili on the 19th, and was broken up into two secondary depressions. One of them made its way towards the northeast, and passed into the Okhotsk, travelling over Southern Siberia, and crossing Southern Saghalien on the 20th. The other secondary which is nothing but the depression under consideration continued its southeast march, and arrived in the strait of Korea on the early morning of the 20th. Changing its course toward NE the depression travelled over Japan sea, and entered into the Pacific, crossing Hokkaido on the 21st. L. B. 753 mm.

VIII. *Continental depression of the 24th to the 25th.*—developed in the Yangtse-valley, and made its way towards the east. Passing near Shanghai on the early morning of the 24th, the depression entered the Eastern sea, and thence passed into Japan sea, touching northern Kiushiu on the afternoon of the same day. After travelling along our northwest coast, the continental depression crossed over the northeastern district, and passed away into the Pacific. L. B. 753 mm.

IX. *Depression of the 24th to the 25th.*—Appeared near the southern Riukiu on the early morning of the 24th, and travelled along the Riukiu and the Pacific coast of Japan proper.

On the early morning of the 25th, the depression passed near the Southeast coast, causing stormy weather there. L. B. 757 mm.

X. *Secondary depression of the 25th.*—developed near Kofu about noon of the 25th, and passed toward ESE. A cyclonic system of wind developed around the centre of depression. L. B. 754 mm.

XI. *Depression of the 28th to the 29th.*—came from the sea south of Formosa on the early morning of the 28th. Moving towards the northeast the depression travelled over the Eastern sea and Japan sea, and entered the Pacific, passing through the strait of Tsugaru on the night of the 29th. L. B. 752 mm.

XII. *Secondary depression of the 28th to the 29th.*—developed in the cyclonic area of the former depression, and first noted near Tokushima on the night of the 28th. Moving toward E the depression travelled along our southeast coast, and passed away into the Pacific. Heavy rain fell in Kii peninsula and Southeastern Japan. L. B. 750 mm.

December.—During the present month nine barometric depressions passed over the empire and neighbouring seas. Most of them were continental cyclones which came from North China and the Yangtsevalley.

I. *Continental depression of the 1st to the 2nd.*—first noted in the northwest of Wladiostok on the 1st. Advancing towards the east the depression crossed over Northern Japan sea and entered the Okhotsk, touching Cape Soya on the morning of the 2nd. The cyclone was of great energy, and caused a rather severe storm and gale in Hokkaido. L. B. 740 mm.

II. *Depression of the 5th to the 7th.*—came from the sea near Luzon on the 5th, and appeared in the Eastern sea on the night of the same day. After moving over Japan sea the depression crossed over Northern Hokkaido on the 7th, and passed away into the Pacific. A severe storm prevailed in Hokkaido. Thunderstorm occurred at Obihiro and neighbouring places. L. B. 730 mm.

III. *Depression of the 6th to the 7th.*—came from the sea east of the Philippines on the 6th, moved northeastwards and appeared off Cape Shiwomisaki on the night of the same day. Thence, the depression travelled eastwards, causing rough weather in Southeastern Japan. L. B. 750 mm.

IV. *Continental cyclone of the 7th to the 8th.*—came from the gulf of Tartary on the night of the 7th and passed southeastwards along the north coast of Hokkaido on the 8th, causing a decided fall of the barometer in Hokkaido. A north westerly gale prevailed during the visitation of the cyclone. L. B. 720 mm

V. *Depression of the 15th to the 16th.*—came from North Korea, and appeared in the Central part of Japan sea on the afternoon of the 15th. Moving southeastward the depression crossed over Japan proper, and passed away into the Pacific on the 16th. L. B. 760 mm.

VI. *Depression of the 15th to the 16th.*—first noted in the sea south of Cape Shiwomisaki on the morning of the 15th. Moving northeastward the depression crossed over the Boso peninsula on the night of the 15th, and passed into the Pacific. L. B. 762 mm.

VII. *Depression of the 19th to the 21th.*—came from the sea south of the Riukiu on the 19th. Moving northeastward the depression travelled along our South and Southeast coasts on the 20th, and passed southeast of Cape Inuboe on the early morning of the 21th. L. B. 763 mm.

VIII. *Continental depression of the 22nd to the 23rd.*—first noted in Japan sea on the afternoon of the 22nd, moved southeastwards and passed into the Pacific, crossing northeastern Japan on the 23rd. L. B. 757 mm.

IX. *Continental depression of the 27th to the 28th.*—came from the upper gorge of the Yangtsekiang, and arrived in the north of Chongking on the 26th. Moving towards ESE the depression passed north of Kiukiang on the evening of the 27th, and entered the Eastern sea from the neighbourhood of Shanghai on the morning of the 28th. After traversing the Eastern sea, the depression passed into the Pacific, and travelled southeastwards. L. B. 757 mm.

II. REMARKABLE TYPHOONS.

In the present chapter the descriptions of the most important cyclonic storms which visited this country during the year 1900 are given.

1. Typhoon of August 17th to 19th.

The approach of the typhoon was indicated by an unusual fall of the barometer in the Riukiu group. On the early morning of the 17th the barometer fell at Western stations generally, but the weather remained very clear, and only a few fragments of fleecy cirrus or cirrostratus were visible. At 6 a.m. the fall of the barometer was quickest at the Oshima station, as shown in the following table which contains the fall of the barometric pressure during the past 8 hours:—

Kagoshima	−0.9	Taihoku	−0.8
Nase	−2.3	Tainan	−1.2
Naha	−1.7	Hoko	−1.1
Ishigaki	−1.4	Koshun	−1.2

Our weather chart of 2 p.m. of the 17th revealed a typhoon approaching to central Riukiu from the Pacific On the morning of the 19th the typhoon was to the east of the Okinawa group, and was steadily advancing towards the north. On the morning of the 19th the cyclonic centre arrived Southern Kiushiu. A rapid fall of the barometer took place in Western Japan, especially in Shikoku and Kiushiu. Stormy weather set in, and a rather heavy rainfall occurred in Southern Kiushiu. At 2 p.m. of the same day the typhoon was lying between Moji and Oita, making its way towards the north. A heavy storm of wind and rain raged over Western Japan. After crossing over the western extremity of Honshiu the centre of storm passed into the Japan sea, and entered the coast of Eastern Siberia on the 20th.

At Miyazaki near which the centre of the typhoon passed the sky became overcast with dense clouds on the morning of the 18th, and a rapid fall of the barometer took place. The velocity of wind was rather small on the morning, but it increased very rapidly, and reached a maximum of 26.4 m. p. s. at 11 a.m. on the 19th. Heavy rain fell, and gushing showers were experienced. The total amount of rainfall for the 4 hours from 6a to 10a on the 19th was 58 mm. We give below an extract of the storm record of the Miyazaki meteorological station :—

Date	Hour	Barometer	Wind direct.	Wind vel.	Weather
18	6a	749.8	NNW	2.5	fair
„	10a	49.8	ENE	7.1	cloudy
„	2p	48.2	ENE	7.5	„
„	6p	47.4	ENE	3.2	slight rain
19	10p	46.8	NNE	5 1	„
„	2a	43.1	ENE	10.0	rain
„	6a	38.5	NNE	10.5	„
„	7a	35.9	NNE	16.2	heavy rain
„	8a	31.3	NNE	17.6	„
„	9a	22.3	NNE	22.7	rain
„	9, 30a	17.3	—	—	heavy rain
„	10a	17.0	WNW	6.9	„
„	10, 30a	20.5	—	—	slight rain
„	11a	25.4	WSW	26.4	„
„	11, 30a	29.4	—	—	„
„	noon	32.8	WSW	19 9	„

Date	Hour	Barometer	Wind direct.	Wind vel.	Weather
19	1p	36.8	W	16.2	cloudy
„	2p	39.4	W	6.0	„
„	3p	41.1	W	8.9	„

Thunderstorm occurred there about 8 p.m. and continued about 1 hour. Gale set in at 2 a.m. on the 19th and continued till 1 p.m. of the same day. But a sudden fall of the wind velocity was observed between 9,30 a.m. and 10,30 a.m. as can be seen from the above table During the interval the barometer fell to the lowest reading, and 717.0 mm. was observed. Judging from the above facts and the varaition of wind direction the centre of typhoon seems to have passed the east of the station.

At **Hiroshima** the barometer indicated 746,0 mm. at 6 a.m. of the 19th, and northeasterly wind was prevailing. But the barometer began to fall very rapidly, rate of fall being 1 mm. per hour, and fell to 737.3 mm. at noon, and 732.2 mm. at 3 p.m., the minimum barometer observed during the passage of the depression. At 10 a.m. of the 19th the wind veered to ESE, and increased in force. The maximum velocity of 46.1 m.p.s. was observed at 3 p.m. High water was due at about 3 p.m. and waves agitated by the furious storm broke over the coast on which the city is situated. In the southern portion of the city of Hiroshima the effect of the tidal waves was to create a depth of water sufficient to float large sampans. A great deal of damage was done to plantation and property.

At **Tadotsu** on the northeast coast of Shikoku province, the tydal wave broke over the coast, and inundated the whole of low land in the neighbourhood of the town at 6 p.m. of the 19th. The hight of the tide was about 1 metre above the usual water line. The maximum wind velocity was 15.6 m.p.s. at 5,10 p.m. the direction being SSW., and the lowest barometer 737.5 mm. occurred at 2,40 p.m.

The path of this typhoon is given by the following data:—

Day	Hour	Position of the centre		Direction	Speed
17	10p	23°20′N	131°10′E	NNW	24.5 km p. hr.
18	6a	25 10	130 0	N	24.5 „
„	10p	28 30	131 0	NNE	40.0 „
19	6a	31 30	131 10	NNE	36.7 „
„	2p	34 0	131 20	NNE	62.2 „
„	10p	38 30	131 30	NNE	

The point of recurving of this typhoon was probably in 25°N and 130°E. It can be seen from the above table that the velocity of typhoon was least near the point, and increased very quickly as the centre went towards the higher latitude.

The northern branch of the parabalic path of the typhoon resembles a straight line.

2. Typhoon of August 22nd to 25th.

On the night of the 22nd a decided fall of the barometer has took place in the southwestern islands, showing the approach of a typhoon from the Pacific. Our weather chart of 10 p.m. revealed distinctly the centre of typhoon to the southeast of the Okinawa group apparently making its way towards NNE. Northerly wind with increasing intensity was prevailing in the Riukiu and southern Kiushiu. Rain was falling at several places there. At 6 a.m of the 23rd the typhoon was already near the Island of Oshima, causing a severe rainstorm in the Riukiu and Kiushiu generally. About noon of the same day the typhoon passed to the southeast of the island, and entered the Eastern sea of China. Heavy rain fell at Nase in the Oshima. The following extract from the storm-record of the Oshima meteorological station shows the meteorological condition prevailed during the visitation of the typhoon :—

Date	Hour	Barometer	Wind direct.	Wind vel.	Weather
23	3p	741.0	SE	8.5	slight rain
,,	4p	40.9	SE	6.5	rain
,,	5p	40.9	SE	6.9	,,
,,	6p	41.0	S	6.4	,,
,,	7p	41.3	S	3.8	,,
,,	8p	41.5	S	4.8	,,
,,	9p	41.5	SE	9.1	slight rain
,,	10p	41.1	SE	8.5	,,
,,	11p	39.9	SE	9.2	heavy rain
,,	m.n	39.9	S	13.9	rain
24	1a	40.7	SSW	8.4	,,
,,	2a	41.2	S	7.6	,,
,,	3a	41.9	SSW	8.1	,,
,,	4a	41.9	S	6.6	,,
,,	5a	42.2	S	7.3	,,

Arriving on the 29th parallel the typhoon recurved towards NE, and entered Japan sea passing between the Goto group and Nagasaki on the night of the 24th. The centre of typhoon travelled along the southeast coast of Korea on the morning of the 26th, and over the western part of Japan sea, and entered the coast of Southern Siberia.

Severe storm raged over the whole of Western Japan on the 24th, but fortunately

the damage caused by heavy rain and high wind was not great. The following table contains the data for studying the progressive motion of the typhoon :—

Date	Hour	Position of centre		Direction	Speed.
22	10p	25° 0′N	130°20′E	NW	37.5 km. p. h.
23	6a	26 30	129 10	NNW	22.8 „
„	2p	28 40	128 30	N	9.8 „
„	10p	29 20	128 20	NNE	9.8 „
24	6a	30 5	128 30	NE	22.8 „
„	2p	31 20	129 0	NNE	24.8 „
„	10p	33 15	129 20	NNE	54.7 „
25	6a	37 10	130 0	NNE	

As usual the speed of the typhoon was very small wear the point of recurving, and rapidly increased as it reached higher latitudes.

3. Typhoon of September 10th to 20th.

This typhoon was first noticed to the south of the Bonin group on the afternoon of the 10th. According to the report from the local office in the Bonins the sign of the approach of the typhoon seems to have been noticed on the 9th. On the day the sky became dark, and presented theatening appearence. On the night the fall of the barometer became very rapid, and showed distinctly that the centre of typhoon was very near the islands. About 3 a.m. on the 10th northeasterly wind increased in intensity, and the barometer stood very low. At 8 a.m. rain began to fell and the force of wind increased to gale. About 10 a.m. a furious storm set in. On the night the wind veered towards SE, and became much stronger. Rainfall became intense. Waves tossed by the tempest dashed on the shore, and broke over there with tremendous noise. On the morning of the 11th the storm ceased, and the weather got better. In the Islands the damaged caused by the storm was very great. Several large trees were rooted; bridges and banks of the rivers were destroyed. The number of houses and building blown down by the gale amounted to 263 in all. Plantations, especially potatoes and bananas were badly injured.

After passing near the Bonins the typhoon moved westwards, and appeared to the east of the Okinawa islands on the morning of the 13th. Moving toward WSW the typhoon crossed over Northern Formosa and the Channel on the 15th, and entered the coast of South China on the early morning of the 16th.

During the visitation of the typhoon, a severe storm occurred in Southern Riukiu. Heavy rain and gale of unusual violence were experienced at Naha and Ishigakijima. We give below extracts from the storm-records at the meteorological-stations of the both localites :—

The Naha meteorological station.

Date	Hour	Barometer	Temperature	Wind direct.	Wind vel.	Weather.
13	1a	745.5	27.2	N	20.1	slight rain
„	4a	41.9	26.5	N	24.5	„
„	6a	38.7	25.3	N	28.6	heavy rain
„	7a	37.5	26.1	N	28.2	slight rain
„	8a	35.9	25.9	N	27.4	rain
„	9a	35.3	26.0	NNE	28.3	„
„	10a	33.7	25.8	NNE	30.8	„
„	11a	31.6	25.8	NNE	31.2	heavy rain
„	Noon	29.8	25.6	NE	33.9	„
„	1p	28.8	25.7	ENE	32.7	„
„	1, 30p	27.3	25.0	NE	30.0	„
„	1, 40p	25.9	25.2	NE	34.7	„
„	2p	27.2	25.9	ENE	28.0	„
„	3p	27.9	26.7	E	25.3	slight rain
„	4p	28.5	27.0	E	25.7	„
„	5p	30.8	26.7	ESE	27.0	„
„	6p	32.6	26.8	ESE	24.4	„
„	10p	40.0	26.2	SE	13.8	„

At Naha the approach of the typhoon was indicated by unusual sky colour. On the evening of the 12th the whole sky presented yellowish hue, owing to the misty weather then prevailing. At that time the typhoon was probably on the 132th meridian.

The Ishigakijima meteorological stations.

Date	Hour	Barometer	Temperature	Wind direct.	Wind force	Weather.
14	5p	737.5	24.3	SW	6	heavy rain
„	6p	37.2	24.2	SW	„	„
„	7p	37.0	24.6	SW	„	„
„	7. 30p	36.8	23.8	SSW	„	„
„	8p	37.0	24.2	SSW	„	„
„	8. 30p	36.8	27.1	SW	„	„
„	9p	37.3	24.2	SSW	„	„
„	10p	37.9	24.1	SW	„	„
„	11p	38.8	24.0	SW	„	„

At Ishigakijima the greatest wind velocity observed was 38,0 m. p. s. at 11,30 a.m. on the 14th. About noon the anemometer of the station was blown away.

After entering the continent the typhoon recurved toward Northeast, and entered again the Eastern sea, passing to the south of Shanghai on the morning of the 17th. But it lost its energy and degenerated into a mere depression. On the 18th it crossed over Southern Korea, and travelled over Japan sea. On the early morning of the 20th the typhoon entered the Pacific passing through the straits of Tsugaru.

This typhoon attended heavy rainfall; the total rainfall at Ishigakijima was 411 mm, the duration of fall being 31 hours; at Taihoku 222 mm. for 22 hours, and at Naha 171 mm. for 42 hours.

The path of the typhoon-centre is approximately given by the following data:—

Day	Hour	Position of centre		Direction	Speed
12	10p	25°50′N	130°30′E	W	20.4 km. p. hr.
13	6a	25 50	128 40	W	17.9
,,	2p	25 45	127 15	WSW	15.5
,,	10p	25 40	126 0	WSW	15.5
14	6a	25 35	124 50	SW	8.2
,,	2p	25 30	124 10	SW	9.0
,,	10p	25 15	123 30	SW	17.9
15	6a	24 50	122 10	SW	14.7
,,	2p	24 40	121 10	WSW	17.9
,,	10p	25 10	120 0	NW	11.4
16	6a	25 50	119 55	N	25.8
17	6a	30 40	122 10	NE	19.0
18	2p	34 45	126 40	NE	13.1
,,	10p	35 30	127 10	NE	22.8
19	6a	36 30	128 50	NE	52.2
,,	2p	38 40	132 50	NE	46.5
,,	10p	40 20	136 30	ENE	85.7
20	6a	41 50	141 40	E	

As can be seen from the above table the motion of the storm centre was very slow in the lower latitude, and very quick in the higher latitude.

IV. Typhoon of September 26th to 29th.

This typhoon was first announced by the Manila Observatory which issued on the 22nd a warning to the effect that a typhoon is situated to the southeast of Luzon and is moving towards northwest. Our weather chart of 2 p.m. on the 26th shows distinctly the centre of typhoon was to the south of Naha. Moving northwestwards the cyclonic centre visited the Okinawa group on the night of the 26th.

There the typhoon changed its course towards NE, and approached our south coast on the 29th. At last the typhoon landed in the neighbourhood of Hamamatsu on the afternoon of the some day, and travelled over Southeastern Japan to the east of the empire.

During the visitation of the typhoon heavy storm raged over the empire, and a great deal of damages were caused by the heavy rainfall and high wind. The following statistics of the damage in the Takunoshima island, Kagoshima prefecture shows the severeness of the storm :—

Houses destroyed	56	Barns, huts etc. damaged	411
Houses half destroyed	106	Sweet potatoes injured	30%
Houses damaged	731	Sugar canes injured	40%
Shipwrecks	2		

At Hamamatsu over which the centre of the typhoon passed the barometer fell to the mininum of 718.5 mm. at 6,30 a m. of the 28th. We give below an extract from the storm record of the Hamamatsu meteorological station :—

Date	Hour	Barometer	Temperature	Wind direct.	Wind vel.	Weather.
27	6p	756.1	21.9	NE	3.6	cloudy
„	10p	54.9	22.0	NE	3.2	rain
28	2a	49.6	24.0	ESE	8.7	„
„	4a	44.0	23.9	SE	16.2	„
„	5a	40.9	24.0	SE	18.0	„
„	5, 30a	36.2	23.6	SE	21.7	heavy rain
„	6a	31.2	22.5	SE	25.2	„
„	6, 30a	18.5	22.0	SW	18.1	rain
„	7a	27.5	21.4	W	22.5	„
„	8a	43.3	18.7	W	14.6	„
„	9a	49.5	19.5	W	10.7	cloudy
„	10a	51.1	20.7	WNW	9.2	„
„	2p	53.0	23.7	WNW	10.2	clear

About 6,30 a.m. on the 28th the wind velocily fell abruptly from 31.2 m.p.s. to 18.5 m.p.s., showing the central calm of the typhoon passed very near the town at that hour. At Numazu the approach of the typhoon was first indicated by cloud caps which appeared on the summit of Mount Fuji on the 27th. Cloud caps of Mout Fuji or they are commonly called " Kasa kumo " are often considered the fore runners of approaching storms. On the afternoon of the 27th rain began to fall, and the barometer continued falling. Wind was blowing from Northeast. On the morning of the 28th the wind veered to SSE, and the barometer fell with the rate of 4 or 5 mm. per seconds. Dark clouds passed over the town from the south, and

weather became very rough and gusty. The minimun barometer (737.2) was observed at 8,10 a.m. Southwesterly gale continued, blowing down several trees, roof-tiles etc.

The following table contains the minimum barometer observed at several stations near which the typhoon passed :—

Station	min. barometer	Date
Naha	730.4	9 pm, 26th.
Oshima	723,2	6, 30 am, 27th.
Yakushima	733.6	1, 10 pm, 27th.
Kochi	739.3	1, 30 am, 28th.
Shiomisaki	721.1	3 am, „
Anjosaki	724.8	4, 30 am, „
Tsu	737.6	5 am, „
Hamamatsu	718.5	6, 30 am, „
Iida	736.5	7 am, „
Kofu	733.9	8, 10 am, „
Tokio	739.2	9 am, „
Kumagae	737.9	9 am, „
Mito	741.7	10 am, „
Utsunomiya	741.5	10, 30 am, „
Kinkasan	745.8	Noon, „

The minimum barometers here given are all reduced to sea-level and to standard gravity.

Heavy rains which attended the typhoon occurred mostly in the west half of the storm-centre. The followings are amount of precipitation at several stations :—

Station	Rainfall	Duration	Station	Rainfall	Duration
Miyazaki	311 mm.	24 hrs.	Naha	143 mm.	14 hrs.
Kochi	253	24	Oshima	137	21
Tokushima	245	36	Wakayama	132	32
Hikone	166	28	Tsu	120	36

The path of the storm is approximately given by the following data :—

Day	Hour	Position of centre		Direction	Speed.
26	2p	24°25′N	128°40′E	NNW	31.8 km.p.hr.
„	10p	26 40	128 40	NNE	11.9 „
27	2p	28 10	129 10	NE	22.4 „
„	10p	29 30	130 5	NE	62.0 „
28	6a	32 40	134 0	NE	38.4 „

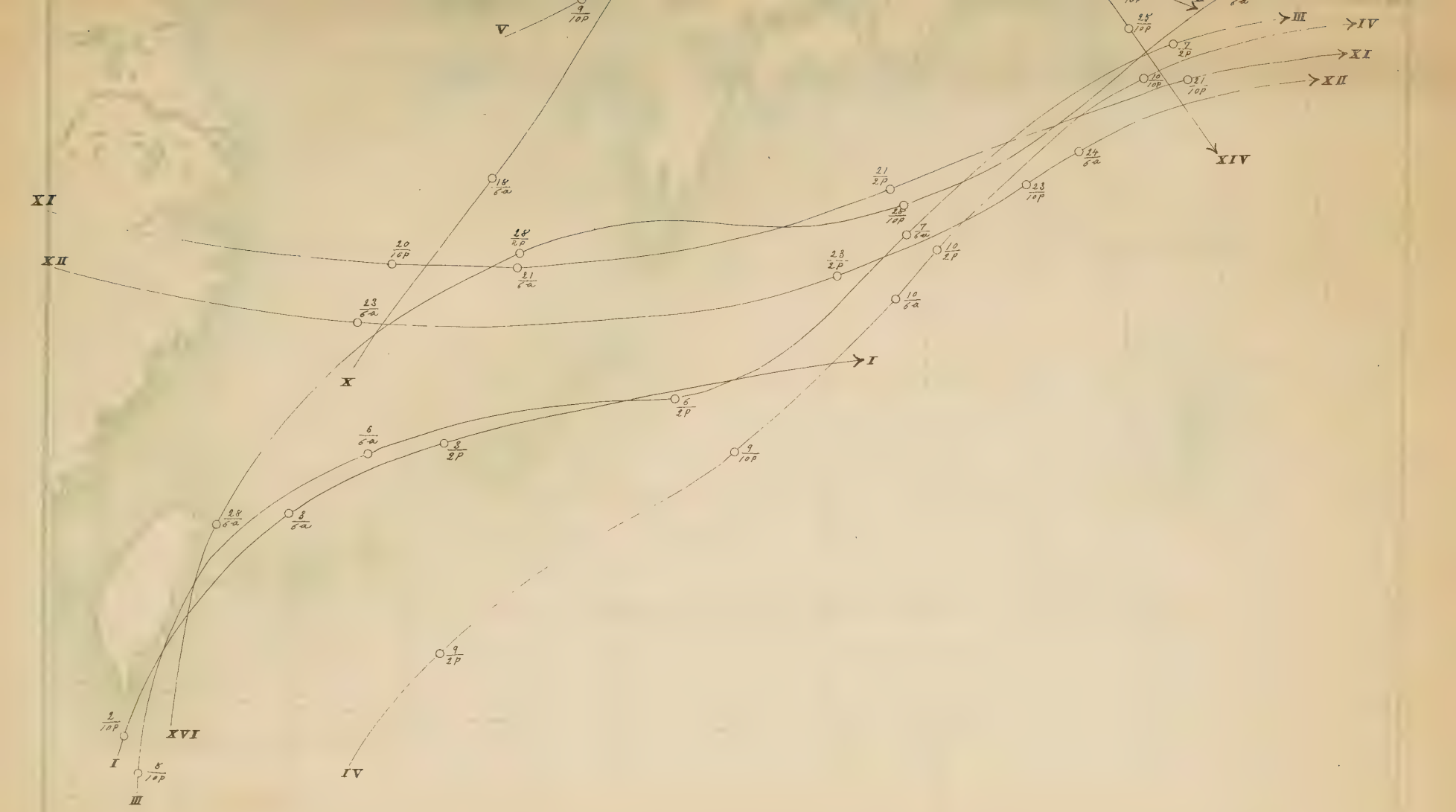
Day	Hour	Position of centre		Direction	Speed
28	2p	34 10	136 50	NE	69.0 km.p.hr.
„	10p	37 40	141 15	NE	

The speed of the typhoon-centre was, as usual, very small near the point of recurving which is probably in the 25,5 N and 128,2° E, and increased in general in the higher latitudes.

PL. I.

TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

January, 1900.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21/10p
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25/10p
7/6a
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23/6a
XI
XII
X
I
6/2p
6/6a
8/2p
9/10p
28/6a
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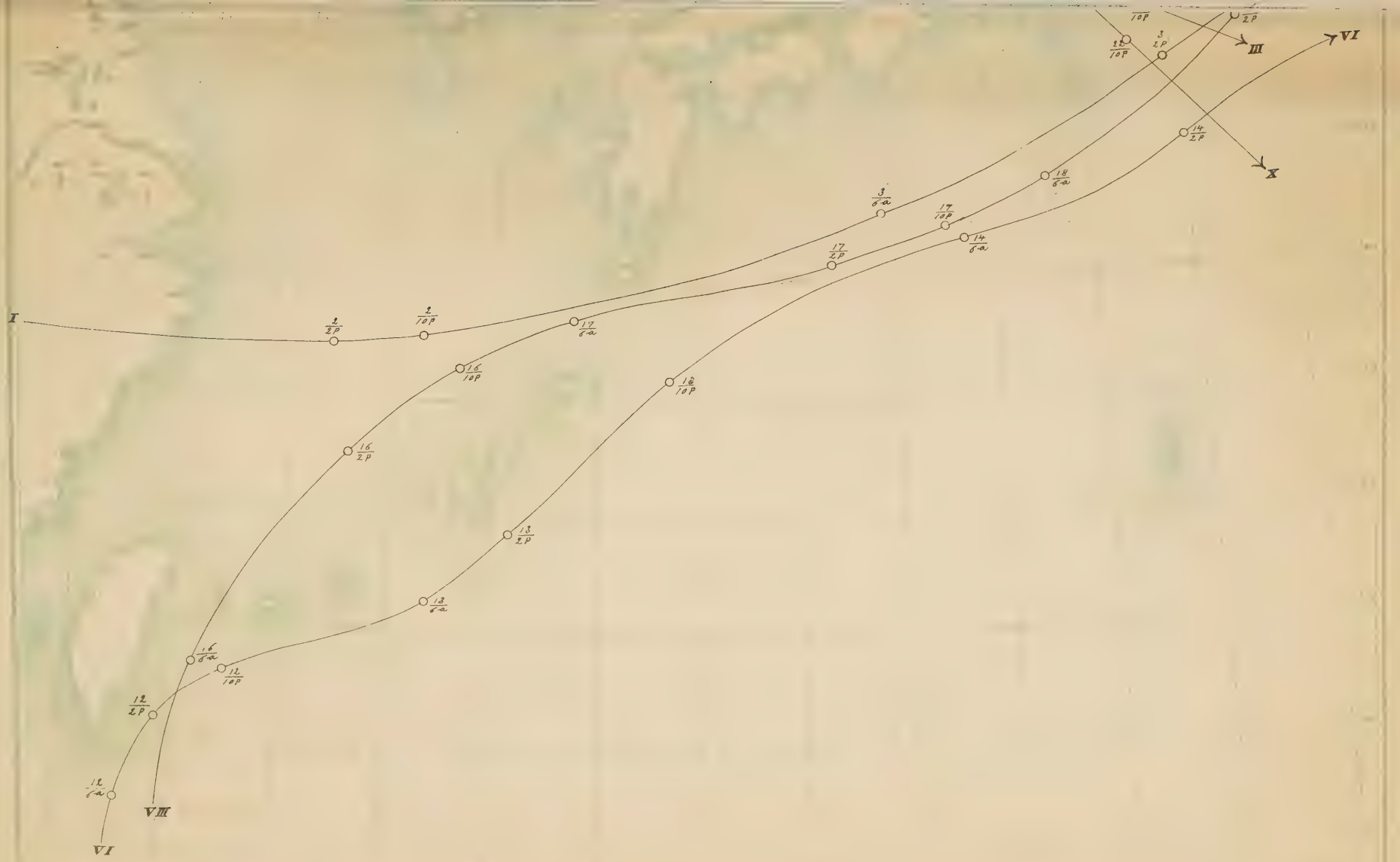
III
IV

PL. II.

TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

February, 1900.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12/6a
13/2P
13/6a
18/10P
3/6a
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14/6a
18/6a
14/2P
12/10P
3/2P
2/10P
2/2P

TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

March, 1900.

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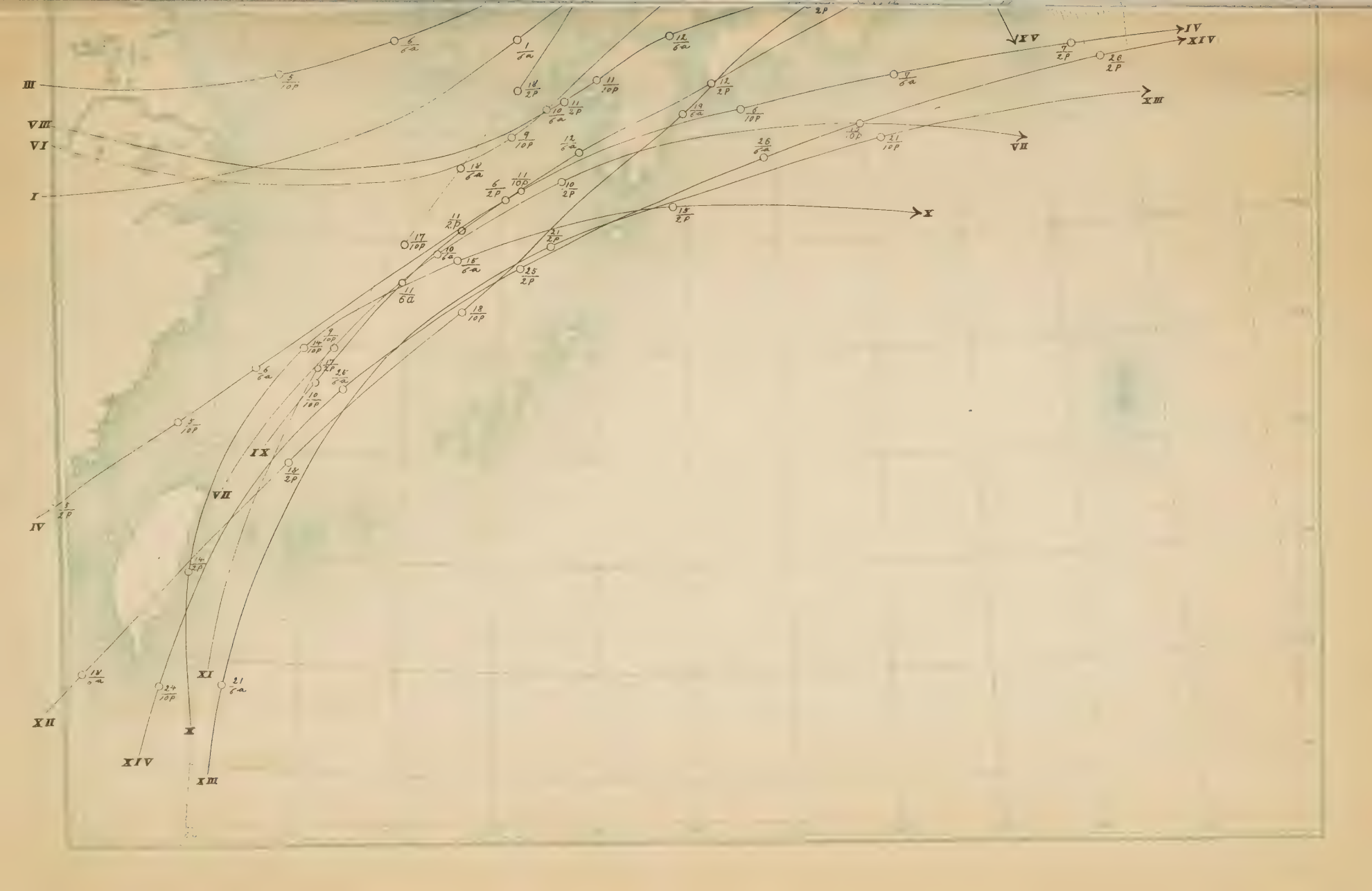
TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

April, 1900.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12/6a
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7/2P
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17/10P
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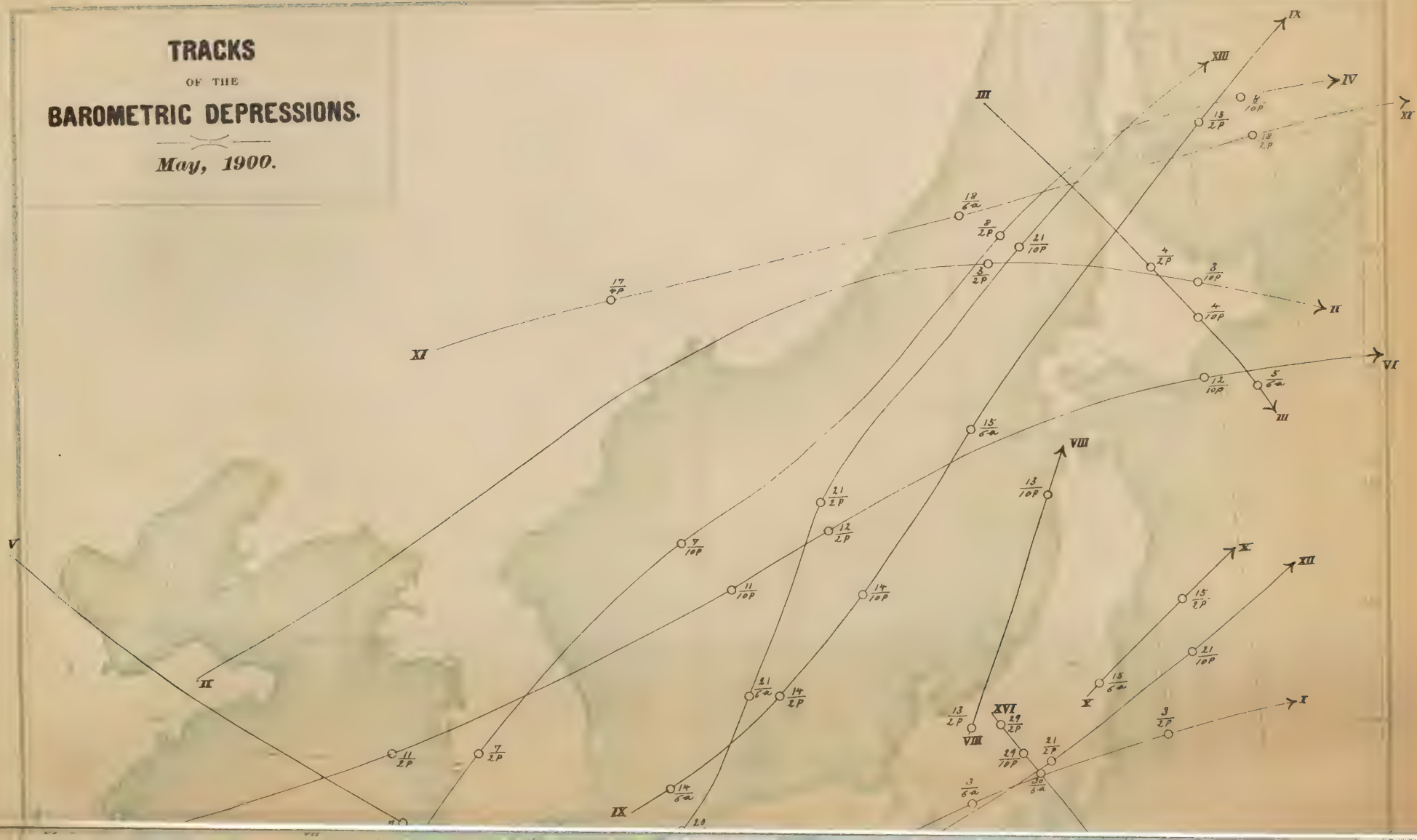
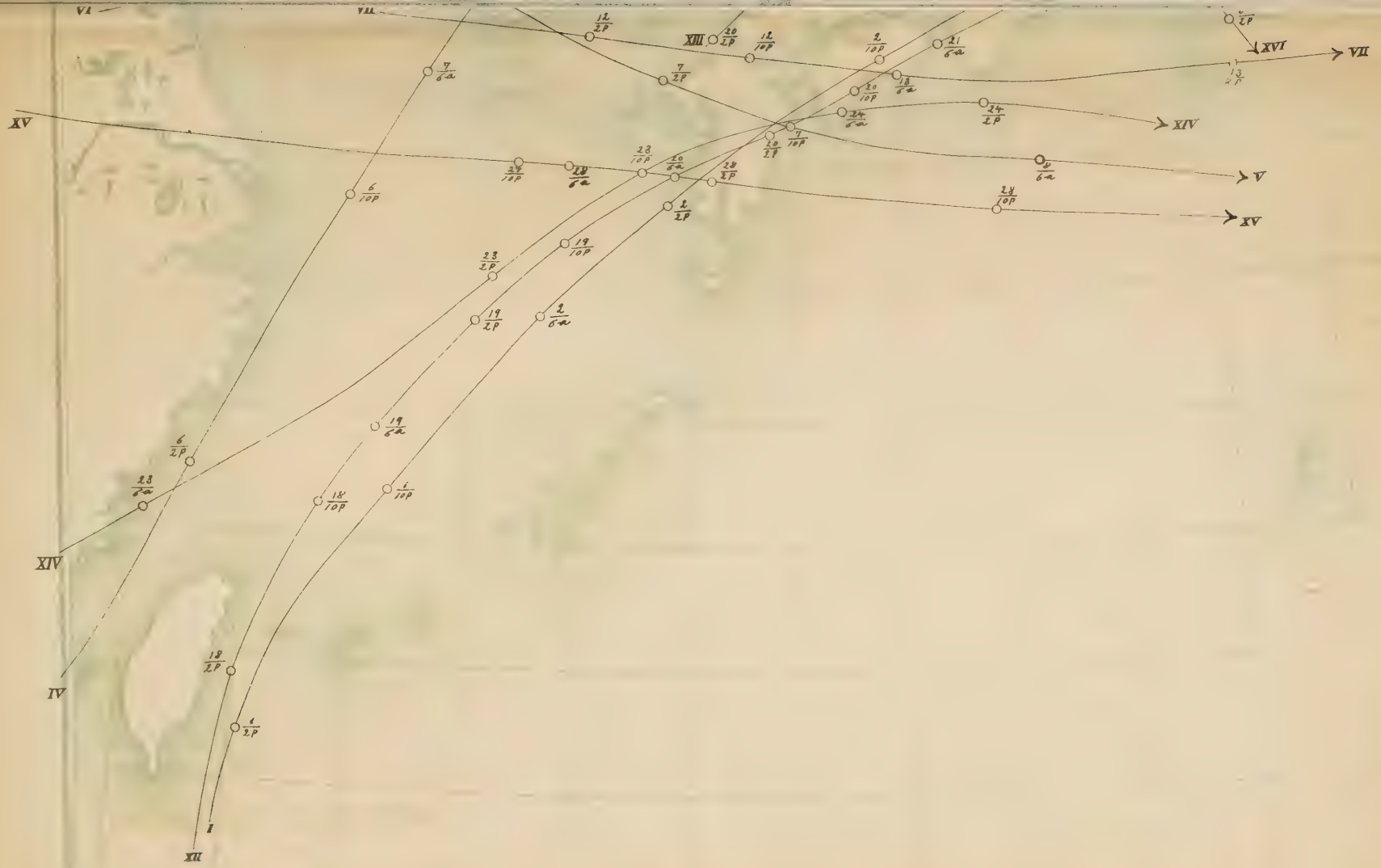
21/6a

TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

May, 1900.

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TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

June, 1900.

III
IV
IX
X
I
10/2P
24/10P
14/2P
14/6a
24/6a
28/2P
24/10P
19/6a
6/2P
6/6a
30/6a
X
13/10P
19/10P
5/10P
5/2P
29/2P
5/6a

TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

July, 1900.

X
IX
I
10/2p
4/2p
4/10p
5/6a
I
7/2p
7/10p
8/6a
12/2p
12/10p
13/6a
VII
5/6a
II
6/10p
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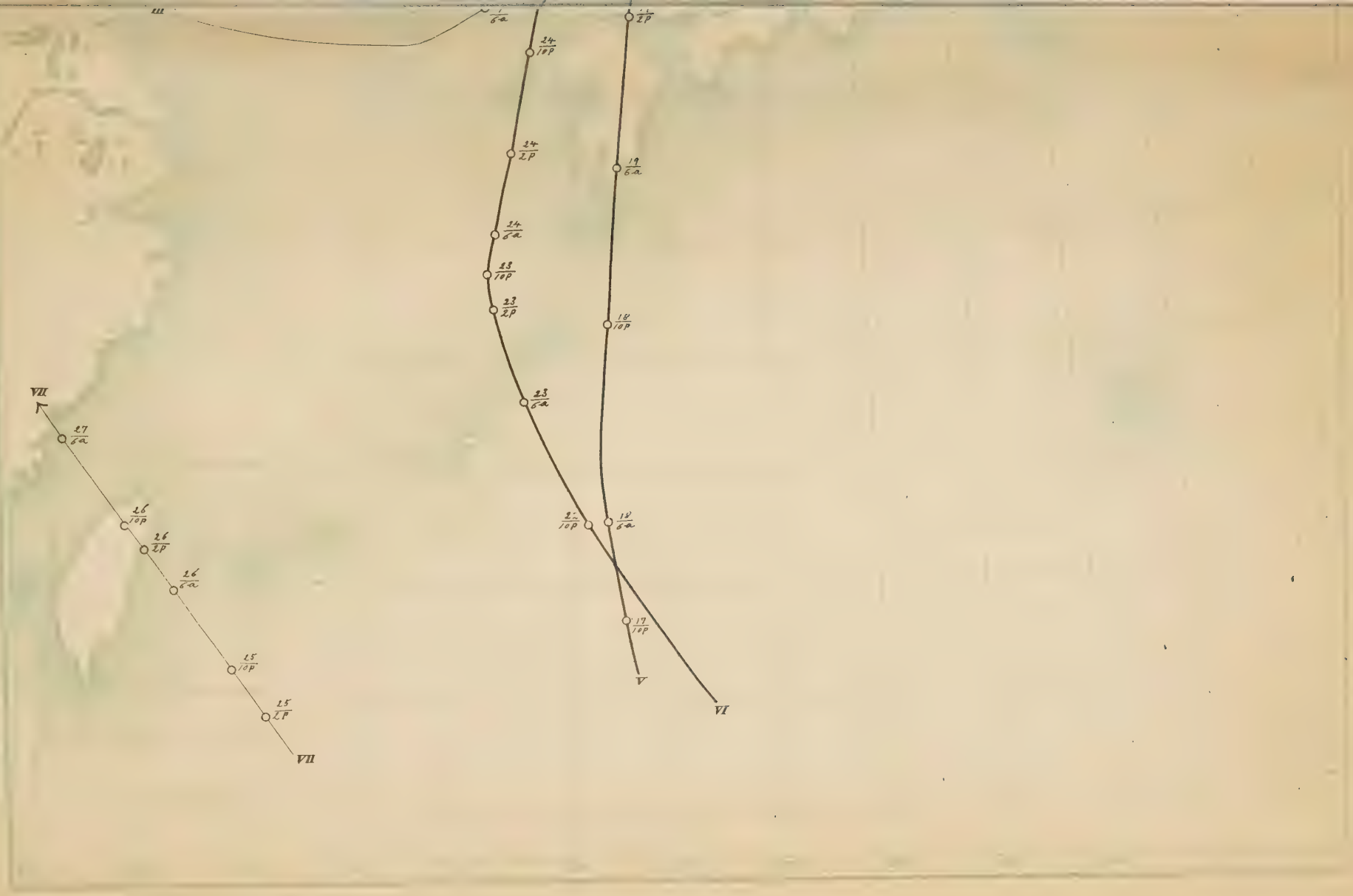
9/10p
6/6a
5/10p
VI
IV

TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

August, 1900.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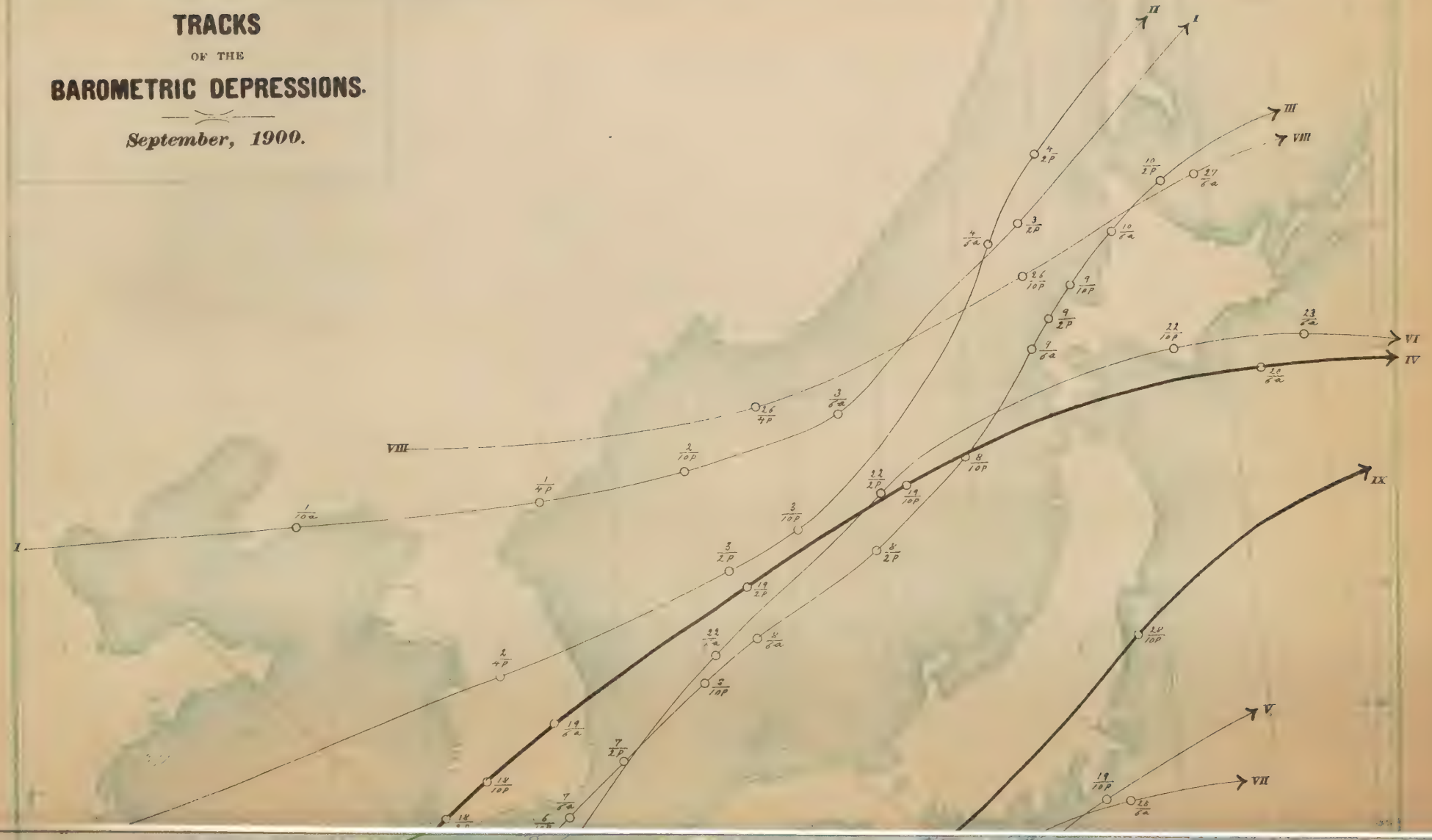
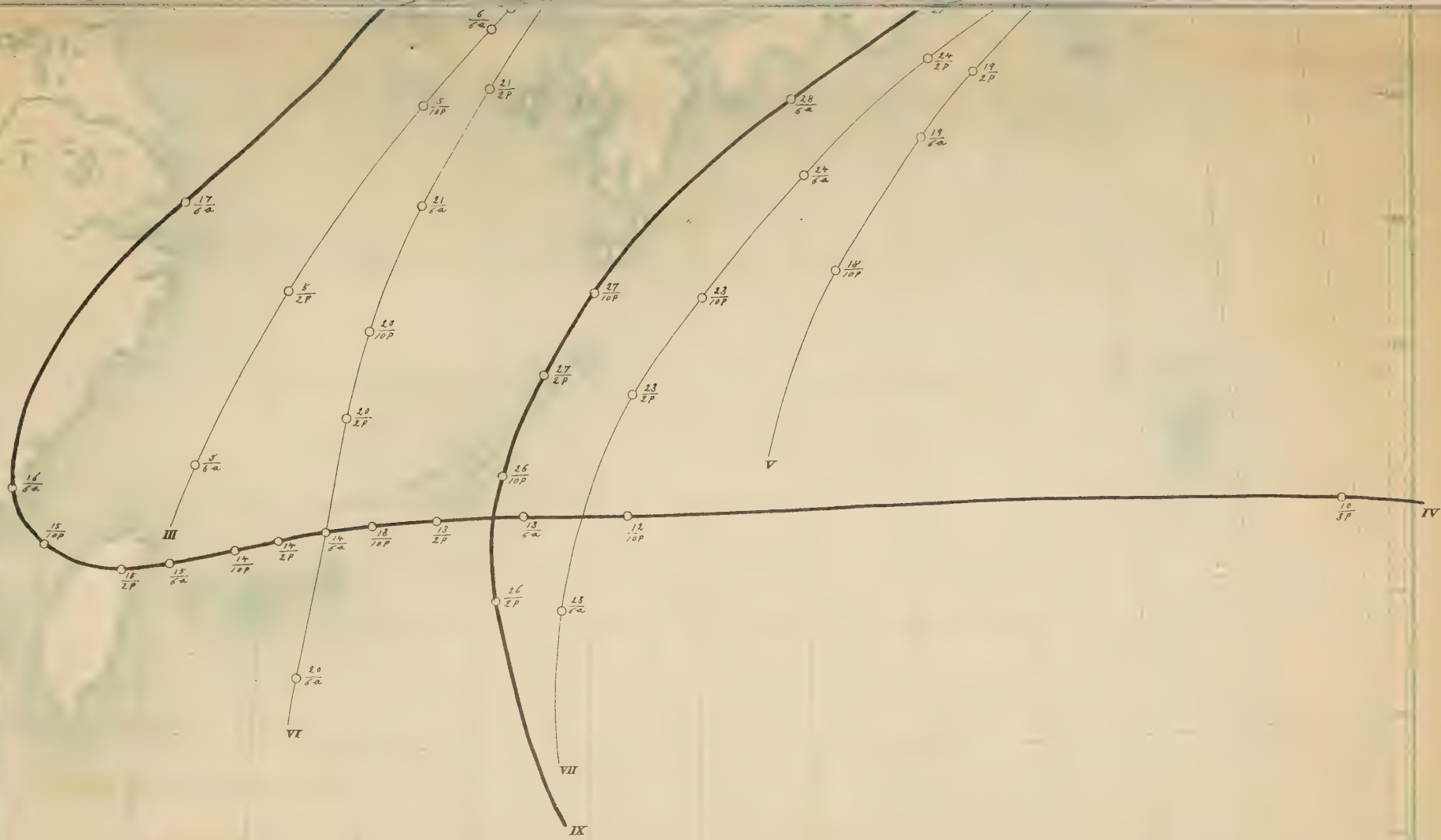
VI

TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

September, 1900.

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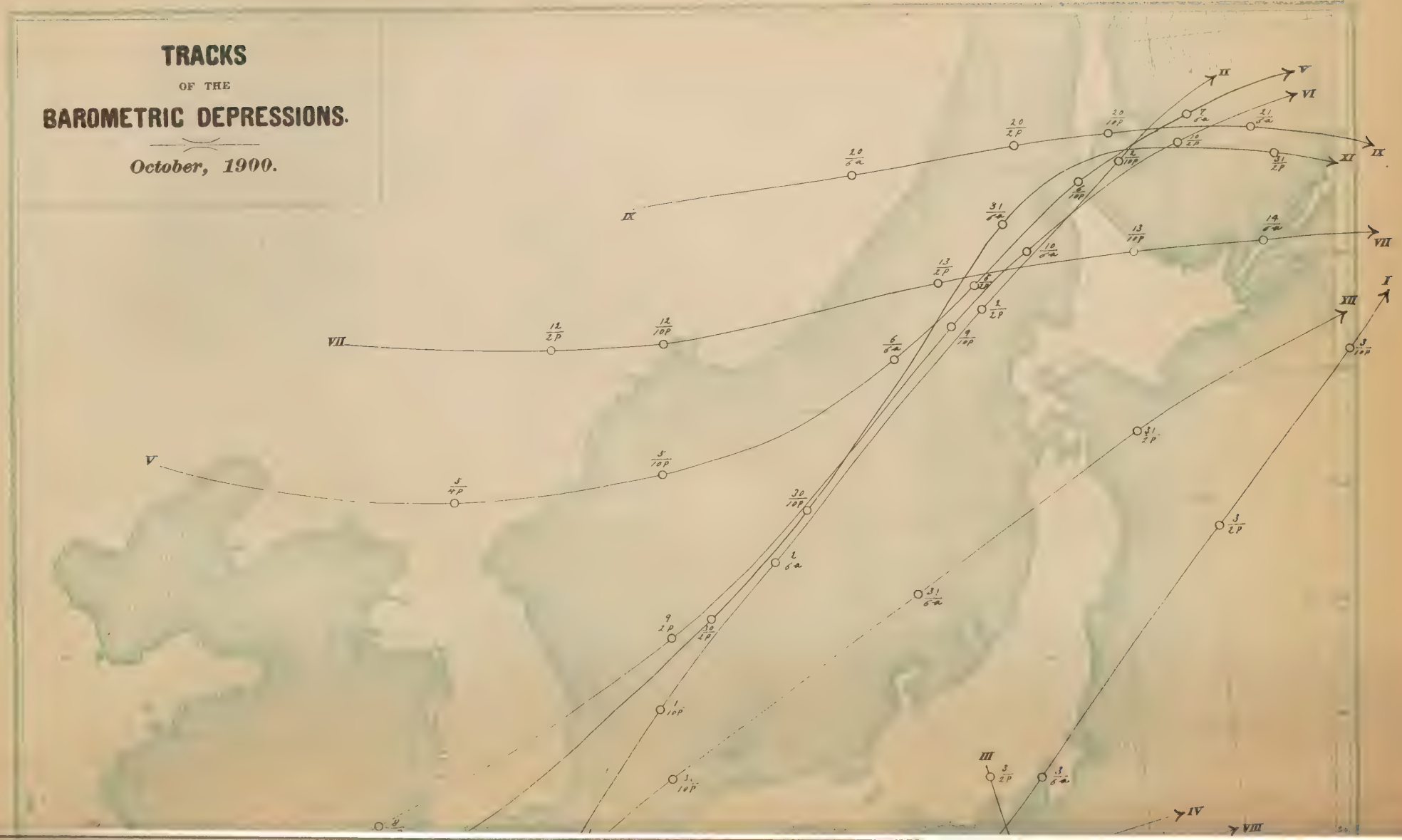
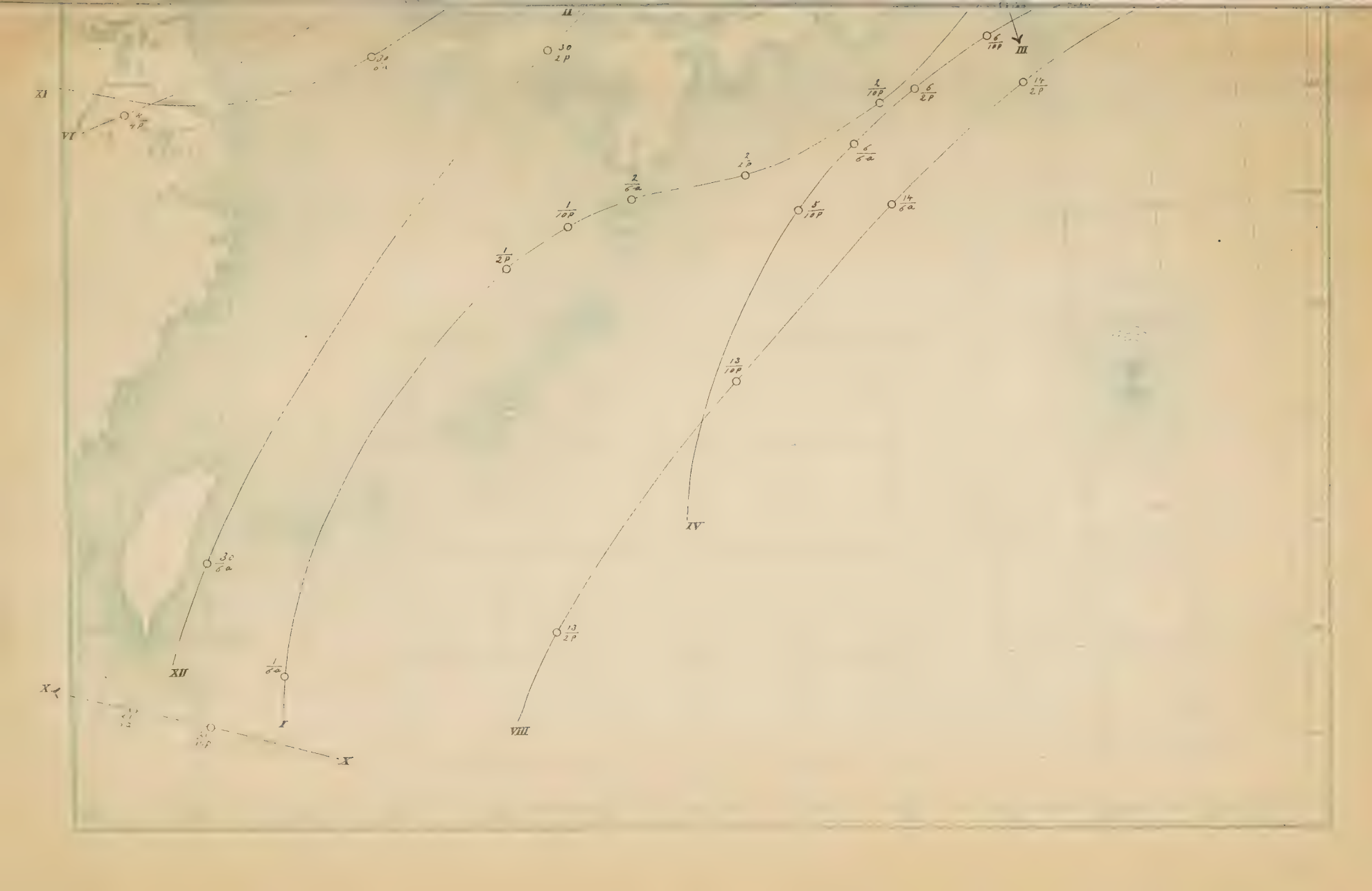
TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

October, 1900.

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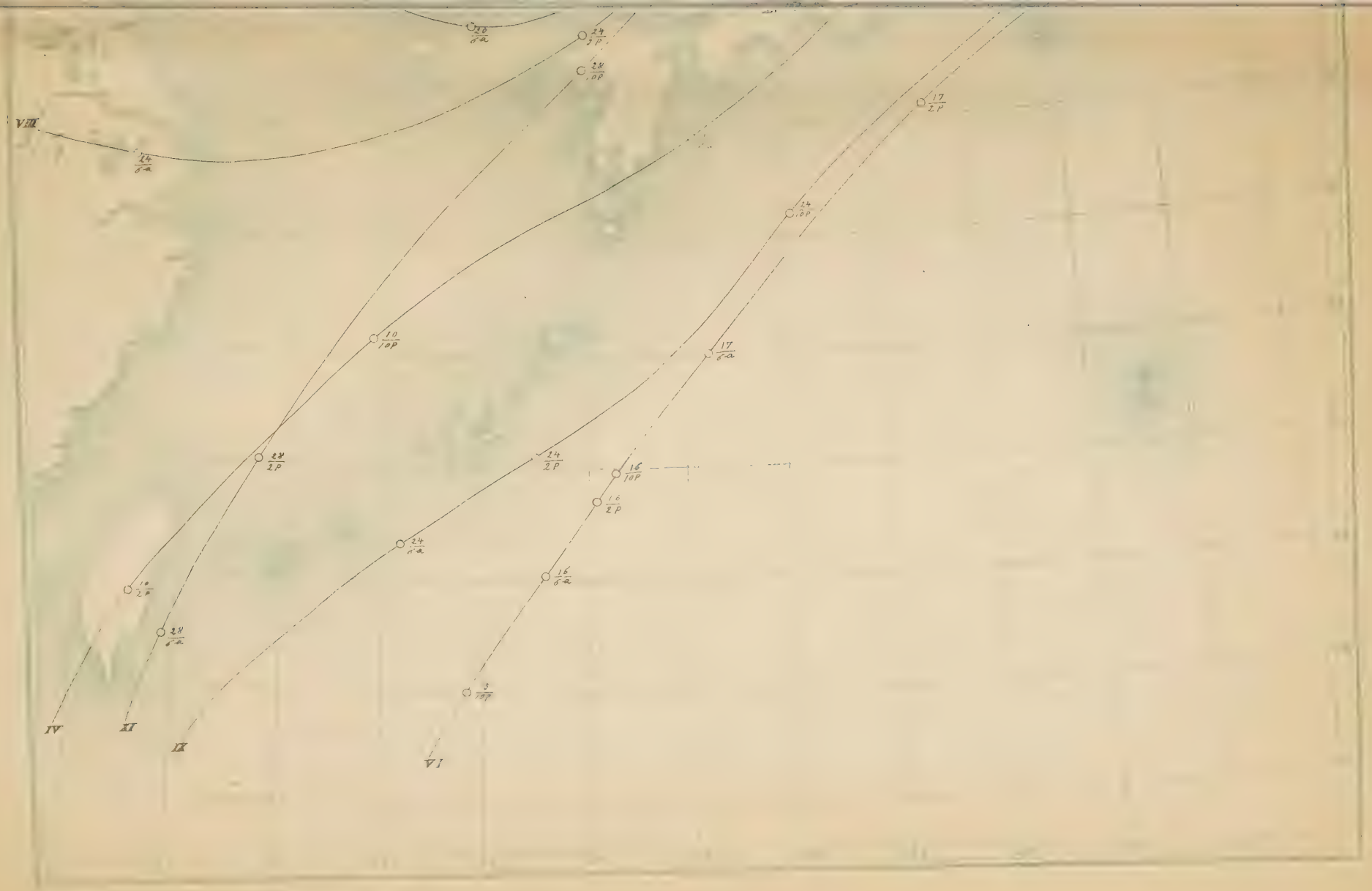
TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

November, 1900.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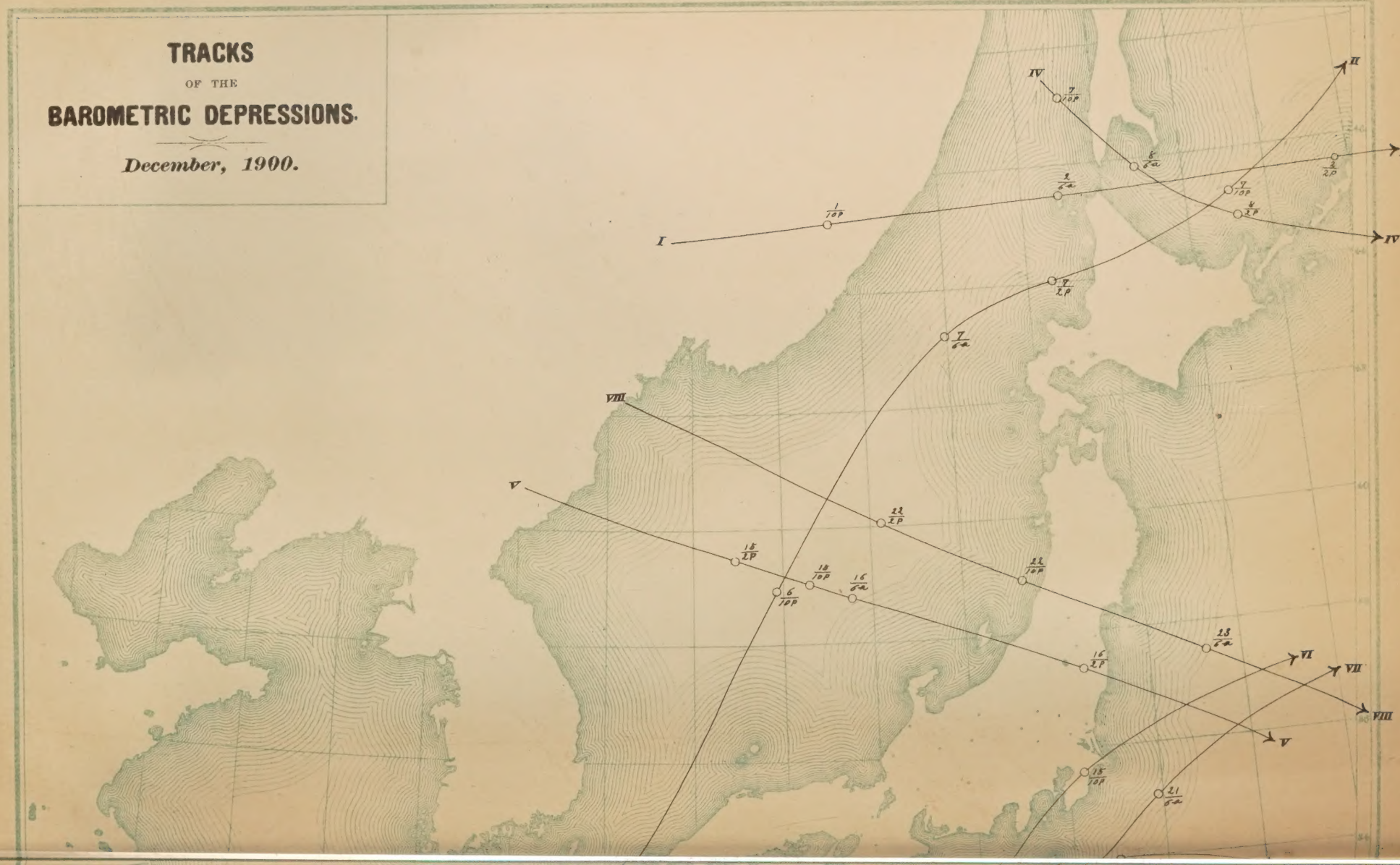
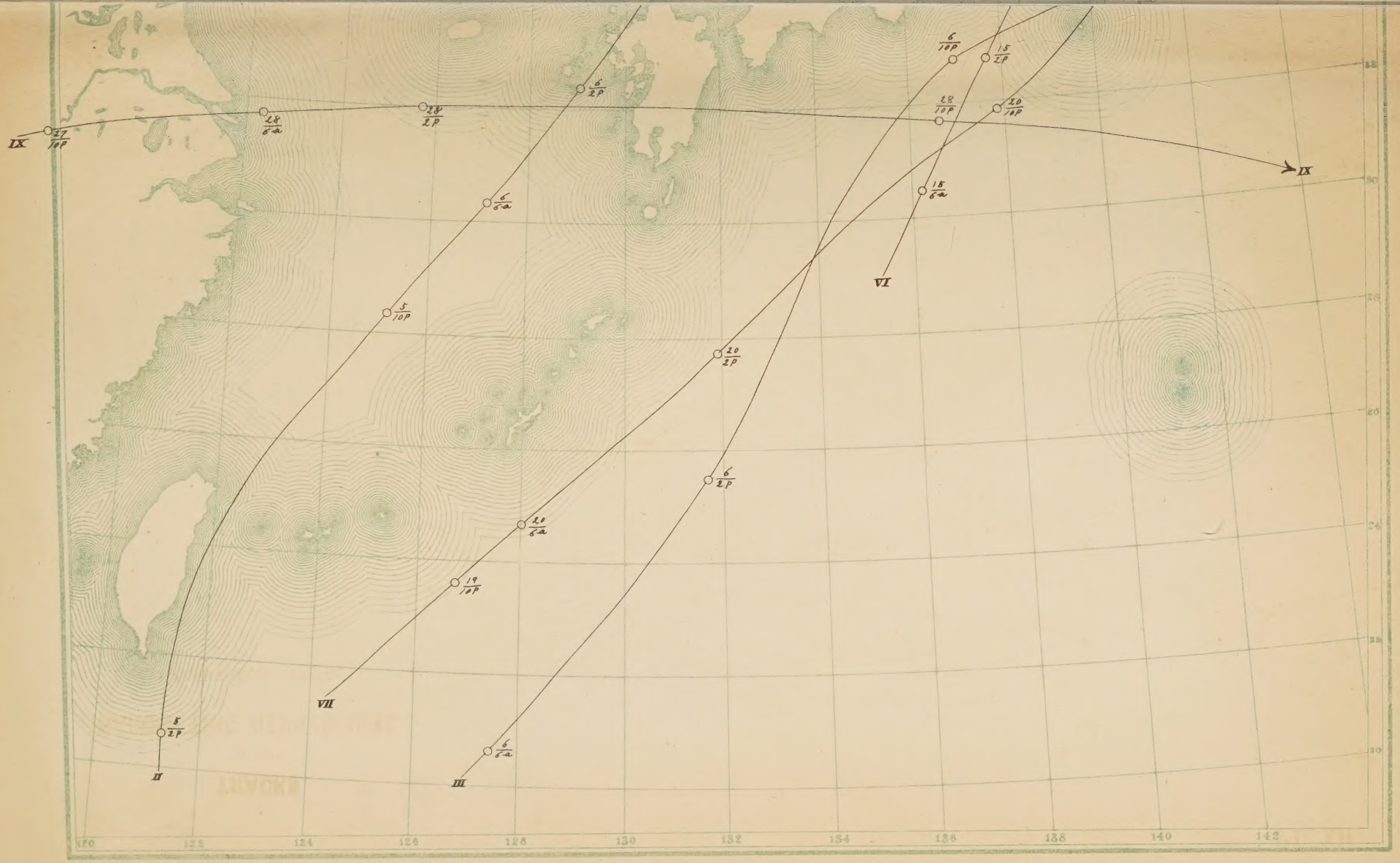
24/2P
16/10P
16/2P
24/σa
10/2P
16/σa
24/σa
5/10P

TRACKS
OF THE
BAROMETRIC DEPRESSIONS.

December, 1900.

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II
VII
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20/2P
III
6/6a
6/2P
VI
6/10P
15/2P
28/10P
20/10P
15/6a
IX
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